Grounding the Linking Competence in Culture and Nature

How Action and Perception Shape the Syntax-Semantics Relationship

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Γνῶθι σεαυτόν
('know thyself')
inscription at the Apollonian temple in Delphi

πάντων χρημάτων μέτρον ἐστὶν ἄνθρωπος
('man is the measure of all things')
Protagoras, cited by Plato, Theaitetos, 152a

Every thing is what it is, and not another thing
Joseph Butler

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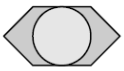
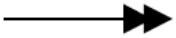
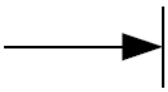
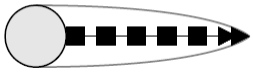
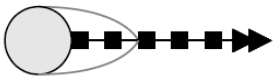
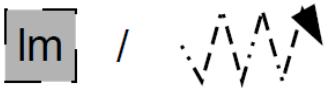
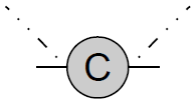
Abbreviations

1/2/3/*n*	(a) grammatical person
	(b) noun classifier
aa(s)	ancillary action (schema)
acc/ACC	accusative
ADJ	adjective
ADV	adverb
agr	agreeing with verb
APPL	applicative
as	action schema
ASH	auxiliary selection hierarchy
AUX	auxiliary
B A*n*	basic assumption no. *n*
C	conceptualizer
C*n* of CFL A*n*	Corollary no. *n* of CFL A*n*
CAPITALS	concept
CFL	Cognitive-Functional Linguistics
CFL A*n*	basic assumption of CFL no. *n*
CL	(a) Chomskyan Linguistics
	(b) classifier
c.o. feat	change of feature
c.o. loc	change of location
csd	caused
CTY	certainty
dat/DAT	dative
DET	determiner
DF	patient's name
DOC	double object construction
expl	expletive
fg	figure
FL(N)	(narrow) language faculty
FRA	patient's name
FV	final vowel
gr	ground
HOL	holistic
HPSG	Head-driven Phrase Structure Grammar
IMP	imperative
IT	inferotemporal cortex
LAD	language acquisition device
LDG	Lexical Decomposition Grammar
LFG	Lexical Functional Grammar
LGN	lateral geniculate nucleus
lm	landmark
m-cellular	magno-cellular
MEP	macro-event property
mtn	motion
mts	motion schema
mvs	movement schema
mvt	movement
NEG	negation
nom/NOM	nominative
NP	nominal phrase

o	object
OM	object marker
obl/OBL	oblique case
p	purpose
p_{eii}	purpose with end in iself
PASS	passive
PAST	past tense
p-cellular	parvo-cellular
PL	plural
PM	possessee
POC	prepositional object construction
POS	possessive marker
PP	prepositional phrase
PR	possessor
PRES	present tense
PRES.IPF	present imperfective
PREF	prefix
PSC	privileged syntactic complement
PTCP	participle
RCP	(responsible) causer preference
REFL	reflexive
resp	responsibility
RRG	Role and Reference Grammar
RSLT	resultative
SAP	speech act participant
SG	singular
SM	subject marker
S/P/A	state/process/activity
SyHD	"Syntax of Hessian Dialects" project
tr	trajector
TR	thematic role
UG	universal grammar
V	(a) verb (b) viewer
V1	primary visual (striate) cortex
V2, V3, V4, V5	extrastriate cortex areas
Vf-*es*	Vorfeld-es

List of symbols

symbol	description	stands for
	circle	figure
	square	default landmark location landmark
	pentagon	object landmark, holistic landmark
	circle upwards inside symbol	incrementally effected landmark (become integrated)
	circle downwards inside symbol	incrementally affected landmark (become disintegrated)
	circle sidewards inside symbol	change of state, feature, location, or identity, but not integrity
	circle inside hexagon	object that is trajector in one, but landmark in another circumstance sub-part
	line	stative relation
	arrow	motion
	double arrow	movement
	zig-zag arrow	causation (exertion of force) by means of motion

	zig-zag double arrow	causation (exertion of force) by means of movement
	arrow with delimiting line	motion coming to destination
	arrow continued by dotted line	motion proceeding in depicted direction
	black line with grey arrow	fictive motion/movement
	squared double arrow leaving figure, embraced by bend lines	emission of inalienable body part or part of some whole (of the figure)
	squared double arrow leaving figure, partially embraced by bend lines	emission of alienable object by means of limb or instrument
	dotted symbol	conceptually necessary, but linguistically[o] non-expressed element
	symbol in shade of grey	linguistically[o] optional element
	circle containing „c“ with solid lines to the sides; dotted lines leaving to the front	Conceptualizer from above with shoulders and simulated visual field

1 Introduction: the argument of this book

The purpose of this work is to launch a discussion about the constitution of the native speaker's linguistic^{o} competence in a philosophically, psychologically, sociologically, neuroscientifically, and linguistically plausible manner.[1] At the same time it is intended to make a first contribution to this discussion. The principal goal is to show that the constitution of the syntax-semantics relationship is as much culturally determined as it is determined by natural factors. This means that if we want to know how sound waves produced by human articulation are assigned something we call "meaning", we have to look at natural and cultural aspects of language users. While the theory I put forward is compatible with virtually all prevalent syntactic descriptive systems, it makes strong claims with respect to semantics. My central thesis regarding the relationship between syntax and semantics is that

- linguistic^{o} utterances conventionally encode conceptual and non-conceptual contents of language users, whereby
  - conceptual contents ultimately originate in perception (in fact they simulate perceptions) and
  - non-conceptual contents originate in socioculturally conventionalized, internalized action and attribution habits enacted within the respective culture. As declarative knowledge, they are imposed on perceptually based conceptual contents which are fundamentally underspecified with respect to actional matters.[2]

Languages, in particular their formal, i.e., syntactic sides, have developed strategies for regularly encoding these conceptual and non-conceptual contents. This is illustrated in Figure 1.1 below, modeled on the semiotic triangle of Ogden & Richards (1965).

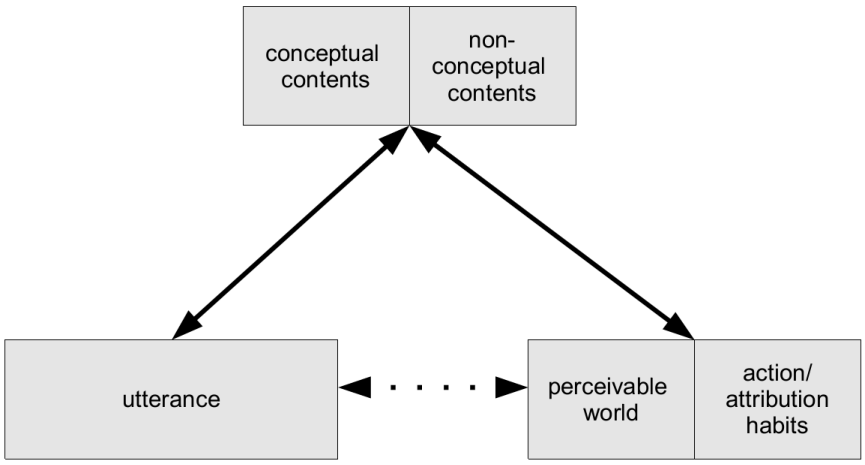


Figure 1.1: Semiotic triangle

[1] As in the case of "biological", the often used term "linguistic" comprises two meanings, namley 'concerning the science of language' and 'concerning language'. In order to properly distinguish both meanings, I will put a superscript "o" for 'object language' at the end of the word, wherever language is concerned. The superscript will be absent when the science of language is meant. I apologize for this notational inconvenience.

[2] As done here, my central arguments, theses, and conclusions will be highlighted by means of boxes.

This work deals mainly with how the German language manages this but I will also indicate for which aspects of the theory cross-linguistic differences may be expected or not. Approaching the syntax-semantics relationship in this way, we must first ask why this relationship is problematic at all.

1.1 Overview: the relationship between syntax and semantics

Philosophers and linguists in the 20th century have come to the conclusion that semantic relations as they have been describing them apparently do not stand in a one-to-one relationship with syntactic relations (cf. Butt 2006, Levin & Rappaport Hovav 2005, Kasper 2008). This can be illustrated with the help of the following contexts, exhibiting the so-called unergative/unaccusative difference (1.1), an agent/patient shift (1.2), and the dative alternation (1.3):

(1.1a) A: *Was macht denn Peter da?* 'What is Peter doing there?'
B: *Er tanzt.* 'He is dancing.'
A: *Das ist ein Krankenhaus. Hier wird nicht getanzt!*
lit. 'This is a hospital. Here is not danced (There is no dancing in here).'

(1.1b) A: *Was macht denn Peter da?* 'What is Peter doing there?'
B: *Er zittert, weil er friert.* 'He is shivering because he is freezing.'
??A: *Das ist eine Sauna. Hier wird nicht gefroren.*[3]
lit. 'This is a sauna. Here is not freezed (There is no freezing in here).'

(1.2a) A: *Was ist denn passiert?* 'What happened?'
B: *Ich habe die Vase zerbrochen.* 'I knocked over the vase.'
A: *Du Idiot!* 'You idiot!'

(1.2b) A: *Was ist denn passiert?* 'What happened?'
B: *Mir ist die Vase zerbrochen.* '(It happened to me that) the vase broke.'
??A: *Du Idiot!* 'You idiot!'

(1.3a) A: *Ich habe einen Brief nach Verona geschickt.* 'I sent a letter to Verona.'
B: *An wen denn?* 'To whom?'
A: *An Anna.* 'To Anna.'

(1.3b) #A: *Ich habe Verona einen Brief geschickt.* 'I sent Verona a letter.'
B: *Wer ist denn Verona?* 'Who is Verona?'
A: *Verona ist eine Stadt in Italien, ich habe den Brief dorthin geschickt.*

[3] Question marks in front of an example indicate that the utterance may be unacceptable/inappropriate to some speakers of German. Double question marks indicate that it may be unacceptable/inappropriate to most speakers.

'Verona is a city in Italy. I sent the letter there.'

In these and many other examples (apparently) similar syntactic structures (as in the (a) and (b) sentences) show divergent behavior with respect to certain operations. However, there are potential generalizations about the syntactic effects of semantic factors which can hardly be accidental. Pānini's early observations of such generalizations in his *Kāraka* Theory (6th century BCE) could be mentioned here (cf. Butt 2006: 15ff.), or the rule for "unmarked" subject choice in terms of semantic deep cases stated by Fillmore (1968: 33, slightly modified).

(1.4) If there is an agent, it becomes the subject; otherwise, if there is an instrument, it becomes the subject; otherwise, the subject is the theme/patient.

There is, then, an asymmetry between syntax and semantics that linguists have to deal with. While syntactic structures are relatively easy to observe in the form of actual utterances, semantic structures, i.e., conceptual and non-conceptual contents, are actually invisible, or opaque, to observation. That means, it is possible to describe certain syntactic regularities (e.g., dependency, valency), while this has been much harder in semantics so far. How can one approach the relationship between syntax and semantics? There are several strategies that have been pursued in the last centuries and decades.

First, one could confine oneself to a descriptive framework (with few explanatory ambitions) and posit an integrated semantico-syntactic structure by imbuing syntax with semantic notions. This view could be characterized as that of classic Latin grammars. These grammars exploit the subject-predicate distinction from Plato's Sophistes. However, such a view begs the question, since it presents the facts evident in the above examples without providing a solution to the problem.

Second, one could grant syntax (in the form of a grammatical competence; cf. Chomsky 1980: 224) an independent status, for reasons of method (cf. Chomsky ^{2}2002: 101). But being able to generate the grammatical and only the grammatical sequences of syntactic units of a language seems to be insufficient. It seems that one must refer to semantic considerations to decide whether or not the odd examples above belong to the language in question.

Third, one could segregate syntax and semantics and concede an independent status to both. Gaining insight into how "meaning" works would then allow the formulation of an interface structure between semantics and syntax. Philosophers and logicians as well as linguists have long hypothesized about the nature of an adequate semantic structure. Concentrating on linguistics here and focussing on the last fifty to sixty years, one can assert that this view is mostly accompanied by a specific theory about the human mind, assuming that it is organized in a (more or less massively) modular way. The modules are then connected via an interface (cf. Chomsky 1986: 68). According to different theories, the dependencies between syntax and semantics as well as the inherent organization of semantics also differ. While Jackendoff (e.g., 2007: 43) grants semantics a generative organization as well, Chomsky has always highlighted the primacy of syntax. With respect to the inherent organization of semantics one has to decide how much semantics may "enter" the interface: only the syntactically relevant structures or greater resources of "knowledge" (e.g., Bouchard 1995, Wunderlich 2000)?

The fourth view could be identified with that of Cognitive-Functional Linguistics (see section 2.1.2). As Langacker (2008a: 5) formulates it in his "content requirement",

> "[…] nothing beyond symbolic structures need be invoked for the proper characterization of complex expressions and the patterns they instantiate. More specifically: lexicon and grammar form a gradation consisting solely in assemblies of symbolic structures. An immediate consequence of this position is that all constructs validly posited for grammatical description […] must in some way be meaningful."

This is in some respects the direct opposite of the former view. Syntax and semantics are not cognitively separated in modules but equally constitute part of our conceptual structure. Linguistic^{o} structures are then pairings of semantic and phonological structures, both being present in our conceptual system. There are no syntactic units, then, which have no semantic, i.e., conceptual import. This means that syntax is constrained by semantic factors but is not completely determined by it (cf. Langacker 2008a: 6). And according to Dik, defending a rather functionalist view (^{2}1997: 7f.),

> "pragmatics is seen as the all-encompassing framework within which semantics and syntax must be studied. Semantics is regarded as instrumental with respect to pragmatics, and syntax as instrumental with respect to semantics. In this view there is no room for something like an 'autonomous' syntax."

Today, most theoretical linguists would presumably subscribe to the third view (but see the introduction to chapter 2). Several grammaticographic traditions could be subsumed under this view, among them Lexical Functional Grammar (LFG; Bresnan 2001), Head-Driven Phrase Structure Grammar (HPSG; Müller ^{2}2008), Jackendoff's Parallel Architecture (Jackendoff 1983, 1987a, 1990, 1997, 2002, 2007), Lexical Decomposition Grammar (LDG, Wunderlich 1997), and many linguists within the Generative tradition (e.g., Grimshaw 1990, Larson 1988, Hale & Keyser 2002). This view can be summarized by means of the following schematic:

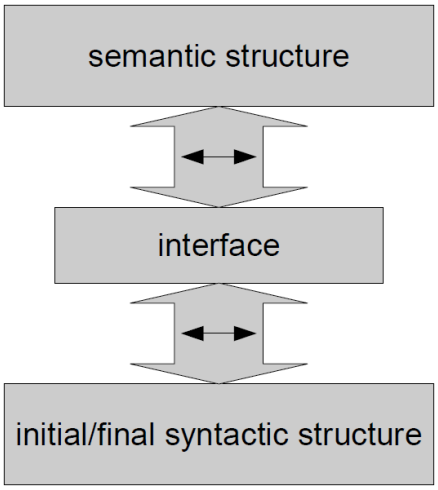


Figure 1.2: Modular view of the syntax-semantics interface

The vertical arrows in Figure 1.2 indicate the bidirectional relations between semantics and syntax. This relation can roughly be illuminated by imagining a language producer and an

interpreter. The former has to encode semantic structures syntactically; the latter has to assign an interpretation to syntactic structures. The horizontal arrows indicate the theory-dependent variability of the width of the interface level, i.e., how many interface notions have to be assumed and of what sort they are (cf. Jackendoff 2002: 218ff.). Although cognitive-functional theories, representing some variants of the fourth view, may not share this view on the organization of the mind and presumably would reject the term "interface", they also attempt to bridge the gap between syntax and semantics (cf. Langacker 2008a, Croft 2001, 2012, Goldberg 1995, 2006, Dik [2]1997, Foley & van Valin 1984, van Valin 2005, van Valin & Diedrichsen 2006 (the latter three in the Role and Reference Grammar (RRG) framework). The interface shall thus account for the wide-ranging dissonances between semantics and syntax.[4] Similar to these frameworks, one goal of my own proposal is to answer the following questions:

- Is there a regular relationship between semantic contents and syntactic structures, and if so, what does it look like?

Obviously, there is a wealth of theories dealing with the syntax-semantics relationship. Why should another one be proposed? The reason is twofold. The first concerns the descriptive means for prevalent semantic theories and its implications. The second concerns the explanatory depth and nature of a particular "interface" notion, namely that of thematic roles. I discuss them in the two following sections.

1.2 Predicate-argument structures

Not all of the theories subscribing to the third view above have an elaborated semantic structure. The research programme design of Chomskyan Linguistics (see section 2.3) makes semantics a secondary matter for it. Consequently, this linguistic tradition lacks a full-fledged theory of how knowledge is to be represented (apart from logic). Within cognitivist and functionalist linguistic theories, especially RRG, as well as in the parallel architecture approach by Jackendoff (1983 and sqq.) semantics play a more important role. Ray Jackendoff (1972 and sqq.), Leonard Talmy (2000), Ronald Langacker (1987 and sqq.), George Lakoff & Mark Johnson (1980, 1999, 2002), and nowadays those working on Construction Grammars (e.g., Fillmore 2006, Goldberg 1995, Arbib & Lee 2008, Croft 2001, 2007, 2012) have long struggled with a conception of semantics as a conceptual semantics, conceiving of conceptual structure and conceptual mechanisms as at least partially determining factors for syntactic structures. These approaches agree in the rejection of what Jackendoff (2002: 107ff.) calls the "syntactocentrism" of Chomskyan Linguistics, i.e., the

[4] Theories defending the modular view employ different means of syntactic description. While many theories within Cognitive-Functional Linguistics use their own descriptive systems, most of the defendants of the third view use some variant of X-Bar syntax (at different stages of development) while differing as to the question of how many syntactic levels should be posited. These descriptive systems allow the formulation of structural relationships holding between syntactic elements, such as one or another variant of dependency, valency, and constituency (cf. Tesnière 1959, Zifonun 2003, van Langendock 2003 on dependency, Ágel 2000 on valency, Matthews 1981, 2007, Zwicky 1985, Chomsky 1981 on both dependency and constituency).

assumption that all non-syntactic representations are derivative of the syntactic representation. Semantic structure usually shares, however, many characteristics with the interface level. The latter, one could say, is conceived of as including all those notions that are both semantically and syntactically indispensable.

And, perhaps surprisingly, despite all their differences, the metaphysical paradigms dominating Chomskyan Linguistics and Cognitive-Functional Linguistics with respect to the syntax-semantics relationship seem to promote predicate-argument structures as the primary means of description.

Most of the theories employ some form of a descriptive system for the interface that is based on logical notions of the type given in (1.5a) and, applied to itself, in (1.5b):

(1.5a) predicate (argument$_1$, argument$_2$, argument$_3$)
(1.5b) predicate (argument$_1$, [(predicate (argument$_1$, argument$_2$, argument$_3$)])

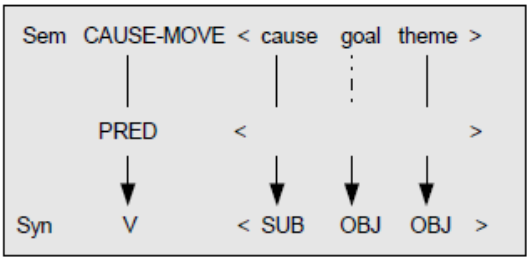
Whether promoted explicitly or not by their respective metaphysical paradigms, predicate-argument structures are actually used as a means of describing relations between semantic units, and as a means to model the syntax-semantics interface, that is, the place where – in accordance with a computational model of the mind – some kind of semantic structure interfaces with some kind of syntactic structure, both of which are considered to be incommensurable with respect to their algebras. It is only at the interface that they are supposed to "communicate".
Since I will be dealing with what is traditionally called "(predicate-) argument structure", a predicate can be identified with the semantic counterpart of a verb and the arguments in (1.5a) with the syntactic counterparts of complements. In (1.5b) the predicate in the square brackets constitutes an argument of the non-embedded predicate. It is the semantic counterpart of a verb, but functions semantically as an argument. Its counterpart is thus a verbal complement.
The range of theories in which predicate-argument structures are employed is remarkable. For instance, Jackendoff (2007) has worked out a theory of conceptual structure which originates in his pioneering work in 1972. At that time, these structures were already designed to represent conceptual content, although Conceptual Semantics only began some time later. Jackendoff is in many respects a representative of prevailing views in theoretical linguistics. He (2007: 236, see also Culicover & Jackendoff 2005, Culicover 2009) uses the following means to represent the conceptual structure of the sentence *Bill amazes me*.

(1.6) [*Bill* CAUSE [I BE [AMAZED (*Bill*)]]]

This is clearly a variant of predicate-argument structures of the sort given in (1.5) in that there is some kind of base predicate of which variables are arguments. So *Bill* is one argument of CAUSE and the complex [I BE [AMAZED (Bill)]] is a second-level function as the second argument of CAUSE.
The same is true of Goldberg's (1995) constructions which also show clear-cut similarities to the descriptive means given in (1.5). In other words, Construction Grammar also makes

extensive use of "classical" predicate-argument structures, even though Construction Grammar rests on other assumptions about mental organization than Jackendoff's parallel architecture account, in that it rejects a modularly organized computational mind, for instance. A Goldbergian construction is given in (1.7) below.

(1.7)



Cognitive Grammar (e.g., Langacker 2008a) allows syntax no autonomy at all, as has been mentioned above. So, syntactic structures must somehow "derive" from conceptual structures in that they symbolize them. In order to make the correspondences between both structures as (theoretically) clear as possible and since syntactic structure is more transparent, it seems quite reasonable to assume conceptual structure to be homomorphic with it. This is expressed in the following quote.

> "What shows that 'hit' is the régissant, to which 'Alfred' and 'Bernard' are subordinated? […] What it means in conceptual and grammatical terms for a component to be the head is that it has the same profile as the composite structure. The composite structure usually inherits its profile from one of the components, which is thus called the profile determinant. 'Hit' is the profile determinant in 'Alfred hits Bernard', since the process it designates is also profiled by the expression as a whole. The verb is thus the head at this level of organization." (Langacker 1994: 75)

In other words, the head in syntactic structure corresponds semantically/conceptually to the profile determinant of the structure, thus yielding parallel structures. In this context, parallel means that the dependency or head-complement relation is directed from predicate to argument in semantics and from verb to complement in syntax.[5]
Within the Principles and Parameters approach (or Government and Binding, if one prefers; cf. Chomsky 1981), such a parallelism is maintained through the idea of θ-roles, which in turn implies some predicate of which the *θ*-role bearers are arguments. Ultimately, this results in a predicate-argument structure as the interface between syntax and semantics, as expressed in (1.8). The form of the so-called *θ*-grids is the appropriate example for the "fabrication" of the desired homomorphism between semantic, interface, and syntactic structures. The example is taken from Belletti and Rizzi (1988: 344).

(1.8) *piacere*: *θ*-grid [Experiencer, Theme]

[5] Although the Cognitive Grammar treatment of profiling and profile determination can be "translated" into predicate-argument structures, it must nevertheless be emphasized that it constitutes an original and independently motivated concept of semantic relations.

Further examples of the employment of predicate-argument structures would be LFG (cf. Bresnan & Kanerva 1989, Bresnan 2001, ch. 14), HPSG (cf. Müller ^{2}2008), Grimshaw (1990) within the Principles and Parameters approach, Wunderlich (2000) within LDG, van Valin (2005) within RRG, Dik (^{2}1997) within Functional Grammar, and Hale & Keyser (2002) within the Minimalist Program, among many others. What is obvious, however, is that theories of grammar and theories of linking belonging to different research programmes and subscribing to different metaphysical paradigms (see part I on these terms) all make use of predicate-argument structures when describing semantic relations underlying syntactic structures in order to establish some parallelism between them.

In the theories of the last decades many principles hypothesized to operate at the interface between semantics and syntax have been formulated, among them the Universal Alignment Hypothesis (Rosen 1984), the Uniformity of Theta Assignment Hypothesis (Baker 1988), the Projection Principle (Chomsky 1981: 29), the θ-criterion (Chomsky 1981: 36), RRG's linking algorithm (van Valin 2005), or Tenny's (1992) Aspectual Interface Hypothesis. These principles concern either causal and/or spatial or aspectual semantic relations and their morphosyntactic expression, and they shall serve the predictability of syntactic structures like those in (1.1) to (1.3) on the basis of the corresponding semantic structures and as frameworks for reading meaning off syntactic structures. Most of the theories make use of some variant of what are now widely known as "semantic" or "thematic" roles, an interface notion relating the semantic arguments like those in (1.5a) and (1.5b) above to verb-complement structures (cf. Gruber 1970 for the "invention" of thematic roles, Grimshaw 1990 on an important contribution to the development of thematic role theories, Dowty 1991, Primus 1999, van Valin 2005 on important attempts to generalize thematic roles, Kasper 2008, Levin & Rappaport-Hovav 2005 on overviews over prominent thematic role theories). Thematic roles are generalizations over the features of the argument(s) of a semantic predicate in order to capture regularities in the mapping between semantic and syntactic structures (cf. Kasper 2008: 23). By means of thematic roles it should be possible to characterize the relationship between syntax and semantics as non-accidental. This is captured in Figure 1.3. Note that a theory about the how semantics and syntax are related non-accidentally needs semantic and syntactic notions which are systematically linked by the interface notions. One of the most useful syntactic notions in this respect has been case (cf. Malchukov & Spencer 2009 for an overview).

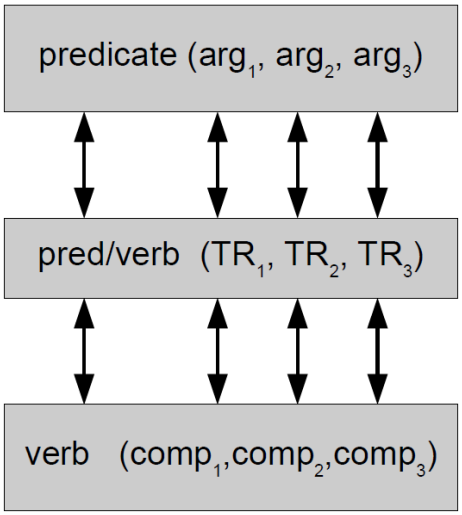


Figure 1.3: Modular view of the syntax-semantics linking by means of thematic roles (arg$_{1\text{-}n}$: argument$_{1\text{-}n}$; TR$_{1\text{-}n}$: thematic role$_{1\text{-}n}$; comp$_{1\text{-}n}$: complement$_{1\text{-}n}$)

The problem of how to describe and explain the relationship between semantic and syntactic units has come to be known as the "linking problem" (cf. Carter 1988). Especially the theories grouped above as the third view have made huge efforts in this respect.

In what follows I will trace the origins of predicate-argument structures and attempt to demonstrate that they are an unexplained means of characterizing both semantic structures and the structures which are supposed to reside in the syntax-semantics interface. Naturally, both are of paramount importance for a theory about the syntax-semantics relationship in that they are employed at two of the three proposed levels (according to Figure 1.3). But if my arguments against the use of predicate-argument structures in those semantic and linking theories which claim to be cognitively plausible are valid, then this would result in a desideratum regarding semantic and interface descriptions and would legitimate an alternative proposal of a linking theory, such as that proposed here.

The scientific history of predicate-argument structures is revealing: In the years before Chomsky's (1965) *Aspects of a theory of syntax*, maybe starting with Chomsky's (1959) review of Skinner's behavioristic theory of language, a (first generation) cognitivistic view of language emerged (see ten Hacken 2009: 103ff. on the earliest stages of Chomskyan Linguistics). Since *Aspects*, theorization in grammar must – at least to a large extent – be identified with the attempt to uncover mental/cognitive structures. One could call this paradigm change a first cognitive turn (cf. Lakoff & Johnson 1999: 75f.): The study of language is identified with how it is supposed to be mentally represented. This is true for many of the theories mentioned above: They try to adequately answer the question of why linguistic^{o} structures (i.e., syntactic structures) work the way they do. The answer is supposed to be found in the human cognitive system, irrespective of different assumptions about the degree of syntactic autonomy. Semantics must from this perspective be considered a cognitive enterprise, too.

A completely different conception of semantics is that of formal semantics which explicitly grew out of formal logic (cf. Lewis ^{2}1972, Montague and Schnelle 1972, Dowty 1979, Cresswell 1991, Heim and Kratzer ^{2}1998). Proponents of this view do not primarily try to show how or to what degree syntax is motivated by the workings of cognition; they try rather

to give a semantic description of the syntactic structures they find. To this end, categorical grammars at least "specify the compositional relationship of meaning to syntax using the convenient notion of a homomorphism between two [syntactic and semantic – S.K.] algebras." (Dowty 1979: 14). This programme is more an exploration of the human ability to reason (logically) in relation to the linguistic[o] structures which express this reasoning than of mental structures. Furthermore it is the attempt to rid us of the imperfections of "natural"[6] language for the sake of scientific progress (e.g. Schächter 1978). The ideas behind this programme can be traced back to the late 19th century and Frege's eminently influential formalization of linguistic[o] structures through the establishment of predicate logic. With this he laid one cornerstone of later truth-functional logic (cf. Tugendhat 1978, Skirbekk ([2]1980). Frege (1879: III/IV; my translation, my emphasis)[7] motivates this programme as follows:

> "Accordingly, we divide all truths that require justification into two kinds, those for which the proof can be carried out purely by means of logic and those for which it must be supported by facts of experience. […] Now, when I came to consider the question to which of these two kinds the judgments of arithmetic belong, I first had to ascertain how far one could proceed in arithmetic by inferences alone, with the sole support of those laws of thought that transcend all particulars. My initial step was to attempt to reduce the concept of ordering in a sequence to that of logical consequence, so as to proceed from there to the concept of number. To prevent anything intuitive (*Anschauliches*) from penetrating here unnoticed, I had to bend every effort to keep the chain of inferences free from gaps. In attempting to comply with this requirement in the strictest way possible I found the inadequacy of language to be an obstacle; no matter how unwieldy the expressions I was ready to accept, I was less and less able, as the relations became more and more complex, to attain the precision that my purpose required."

Frege drew the conclusion that he had to formalize natural language in order to gain exactness of reasoning, i.e., to attain the precision his purpose required. His ultimate purpose was the finding of a scientific truth or at least to find a way of establishing a method to get there (cf. Frege 1879: III). He therefore took Plato's classical subject-predicate distinction and modified it into a logical function. A function (e.g., "$f(\ ) = 2 \cdot (\ )^3 + (\ )$", cf. Frege 1962: 16) is an unsaturated expression and must be saturated by an argument expression which in turn is saturated *per se*. Together they form a whole (e.g., "$f(4) = 2 \cdot 4^3 + 4$"). Translated into natural language this means that there are unsaturated elements (for our purposes: verbs) and saturated elements (for our purposes: complements). The result is the structure given in the form of predicate-argument structures, consisting of a relational expression R (the unsaturated element – a predicate) and some (ordered) saturating argument(s): $R(x, y, z)$. The replacement of language structures with such a formal descriptive system was adopted by, e.g.,

[6] The term "natural" stands in opposition to "artificial" here, not to "cultural". Language as a means of communication in everyday praxis is a natural as well as a cultural phenomenon (see ch. 2, introduction) and both are opposed to "artificial". I will use"natural" here, however, as a placeholder.

[7] From the original: "Wir theilen danach alle Wahrheiten, die einer Begründung bedürfen, in zwei Arten, indem der Beweis bei den einen rein logisch vorgehen kann, bei den andern sich auf Erfahrungsthatsachen stützen muss. […] Indem ich mir nun die Frage vorlegte, zu welcher dieser beiden Arten die arithmetischen Urtheile gehörten, musste ich zunächst versuchen, wie weit man in der Arithmetik durch Schlüsse allein gelangen könnte, nur gestützt auf die Gesetze des Denkens, die über allen Besonderheiten erhaben sind. Der Gang war hierbei dieser, dass ich zuerst den Begriff der Anordnung in einer Reihe auf die logische Folge zurückzuführen suchte, um von hier aus zum Zahlbegriff fortzuschreiten. Damit sich hierbei nicht unbemerkt etwas Anschauliches eindrängen könnte, musste Alles auf die Lückenlosigkeit der Schlusskette ankommen. Indem ich diese Forderung auf das strengste zu erfüllen trachtete, fand ich ein Hindernis in der Unzulänglichkeit der Sprache, die bei aller entstehenden Schwerfälligkeit des Ausdrucks doch, je verwickelter die Beziehungen wurden, desto weniger die Genauigkeit erreichen ließ, welche mein Zweck verlangte."

Wittgenstein (2003), Carnap (^{2}1968), and Schmidt (^{2}1959). It is thus not accidental that Heim and Kratzer (^{2}1998: 13) claim to execute the "Fregean Program" within their semantics for Generative Grammar.

This is the crucial point: In Frege's formalization of natural language expressions in logical terms we find the common ancestor of both of the descriptive systems mentioned above: that of the conceptions of semantics which grew out of formal logic and that of a cognitively oriented semantics. The structures in (1.6), (1.7), and (1.8) originate in Frege's work and, as a means of formalizing natural language expressions, the underlying descriptive apparatus has "gained access" into natural language semantics.

Talking about semantics is then highly ambiguous with respect to the following questions: What exactly do we want to describe? Is it logical relations and the relationships between our language systems and what happens in the external world or possible worlds (cf. Lyons 1991, Löbner 2003, ch. 4, 6, 10 for overviews), or is it cognitive structures and the roles they play with respect to the structures of our language systems (cf. Langacker 2008a, ch. 2 on a conceptual semantics)? Do we want to avoid the imperfection of natural language by formalizing it or do we want to explore the cognitive structures that may be responsible for this imperfection? Do we want to separate true from false sentences for the sake of scientific progress or do we explore cognitive structures for their own sake? These questions point to completely different research purposes and they culminate in the question of whether our descriptive means are tuned to the subject-matter of our theory. One could ask whether this labelling is important at all. Does it matter whether we use predicate-argument structures in the context of logic, formal semantics, or truth-functional semantics or in the context of a cognitive semantics? The answer must be affirmative, since the choice of descriptive means must be geared to the subject-matter and purposes of research. Apparently – and this is the reason for such extensive explanations – semantic researchers use the same means of description, while fundamentally differing in their scientific research goals.

It is precisely at this point that I sense a problem in the historical development of descriptive means in linguistic^o semantics: The theories about the syntax-semantics relationship mentioned above claim to be cognitively plausible but at the same time make use of the instruments of logic originating in Frege's conception of linguistic^o structures as functions. This choice not only seems to ignore the ontological orientation of the perspectives on semantics originating in classical logic (external/possible world ↔ linguistic^o structure) which are not compatible with that of a cognitively oriented semantics (concepts ↔ linguistic^o structure)[8] (cf. Jackendoff 2002: 294ff., Lyons 1991), but it also imports other implications of the descriptive means as well, namely a dependency relation between predicates and

[8] Jackendoff (2002: 296) admits that "[i]n principle formal semantics is neutral about its metaphysics" which would mean about its ontological orientation, but Jackendoff (ibid.) states in the same breath that "on the whole 'language' is taken to retain its common-sense status as something 'out there in the world'". David Lewis, a possible-world formal semanticist is explicit about this in that he distinguishes "first, the description of possible languages or grammars as abstract semantic systems whereby symbols are associated with aspects of the world; and second, the description of the psychological and sociological facts whereby a particular one of these abstract semantic systems is the one used by a person or population. Only confusion comes of mixing these two topics." (^{2}1972: 170). Lewis' concern is with the former, and in the eyes of a cognitively oriented semanticist he "attempts to account for human reason without taking human beings into account at all. The assumption that the mind is a mirror of nature allows model-theoretic semanticists to bypass the mind altogether." (Lakoff 1987: 206).

arguments which is possibly modelled on that from verb to complement, although matters could be "mirror-inverted" here (Leiss 2003, see section 3.5 in the present work). This is clearly an empirical question, and empirical results thus determine how semantic structures should be described. This will be addressed in detail in sections 3.3 and 3.4. As a consequence, the branch of semantics dealing with cognitive structures has, from the beginnings of cognitively oriented linguistics until today, made use of a descriptive system that originates in another scientific discipline and that requires empirical validation. Taken together, predicate-argument structures have unexplained theoretical and methodological legitimation.

The question of legitimation affects all those linking principles proposed so far in theoretical linguistics which conceive of syntax and semantics as exhibiting parallel structures, gained by employing predicate-argument structures. The use of predicate-argument structures facilitates the relating of semantic and syntactic elements in that the dependencies among semantic elements (argument dependent on predicate) are modelled as being parallel to the dependencies among syntactic elements (complement dependent on verb). The idea of a one-to-one mapping between syntax and semantics is a consequence of the adaptation of the means of description from formal sciences, although they all claim to be part of cognitively significant theories.

To sum up, it should be clear that there is a problem with a class of semantic theories claiming to be cognitively relevant; it concerns their means of description, which originates in a branch of science based on completely different research-programmatic (including ontological) premises, namely those of logic.[9]

A theory of the syntax-semantics relationship not only requires a knowledge structure which is tuned to the underlying research programme and which is grounded both in perception and action but also one whose descriptive means must be motivated.

It must not be in any way concealed or denied, however, that all the aforementioned theories and proposals mentioned above and using predicate-argument structures have brought us

[9] What about the concepts of valency and dependency? It is clear that my criticism towards them can only be valid if they are applied to semantics and at the same time are claimed to be cognitively relevant. Now, Tesnière (1959: 41 ; my translation), the father of the concept of dependency, states that "the structural [or syntactic – SK] and the semantic level are […] theoretically completely independent from each other." But he also states (1959: 40; my translation) that "on the structural level the linguistic expression of thought constitutes itself" and, more importantly, "between these two [levels – SK] there is no identity but parallelism." (Tesnière 1959: 42; my translation). What is the scientific status of semantics, then? "The semantic level is external to the grammar, it belongs solely to psychology and to logic." (Tesnière 1959: 40; my translation). The last quotation seems to indicate that psychology and logic are to be treated as one here, i.e., as indistinguishable. As a consequence, Tesnière attributes psychological significance to semantics. What is also remarkable is that elsewhere (cf. Tesnière 1959: 238) he uses Fregean terminology, when he says that a verb is "saturated" (*saturé*). Admittedly, I do not know whether this is purely accidental. But in sum, although syntax is conceived of as autonomous, it expresses "psychic" content. The locus of this content is conceived of as being structurally parallel to syntactic structure. Although Tesnière delegates research into semantic structure to psychology and logic, many of his successors in the field of valency theory have availed themselves of predicate-argument structures in order to describe such mental structures or processes (cf. Bondzio 1976, 1980, Heringer 1983, 1985, Jacobs 1994, 2003, the volume by Herbst & Götz-Votteler 2007, among many others). Whether implicitly or explicitly, they also rely on the parallelism thesis concerning predicate and argument on the one hand, and head and dependent on the other – an assumption which, as has been shown, is problematic. One could conclude from this that a semantic valency theory which is modelled parallel to predicate-argument structures is subject to the same problems.

extraordinarily rich insights into the syntax-semantics relationship and have led us far in explaining it (cf. Levin & Rappaport Hovav 2005 for an overview). From this discussion we can derive another question I will try to answer in the present work:

- Are there alternative descriptive means for semantic contents as coded by verb-complement structures? How must they be conceived, given that they have to be empirically plausible?

As mentioned at the end of the previous section, the second factor that might legitimize a new proposal concerning the syntax-semantics relationship involves the explanatory depth and nature of thematic roles.

1.3 The metaphysics of thematic roles

The following fictional but true-to-life scenario will help to illustrate my point.

(1.9) The three-year-old twins Jessica and Nicole are at dinner with their parents Sarah and Marc. Nicole reaches for the milk carton. She grips it only with her fingertips, causing it to fall down. It falls off the table and runs all over the floor. Jessica and her mother have kept track of what happened.

(a) Jessica: *Nicole hat die Milch runtergeworfen*.
Nicole.3NOM have.3AUX the.ACC milk down-throw.PTCP
'Nicole knocked over the milk.'

Sarah: (hesitating, looking at the surprised causer)

(b) *Nein, sie ist ihr runtergefallen*.
No it.3NOM be.3AUX her.DAT down-fall.PTCP
'No, (it happened to her that) it fell down.'

Jessica: … (not signalling misunderstanding)

In this type of event with which every speaker of German is certainly familiar there is a single event (Nicole knocking over the milk) with two alternative verbalizations (Jessica's and Sarah's). However, these verbalizations are not paraphrases of each other but differ in "meaning". Using classical terminology, while the (a) sentence makes Nicole the "agent" of the event, the (b) sentence makes her an "experiencer". The milk is a "theme" in both sentences.
Broadly speaking, linking theories have mainly employed two kinds of thematic roles, namely those concerning objects involved in spatio-temporal circumstances (e.g., source, goal,

location, theme, etc., cf. Gruber 1970, Jackendoff 1972 et sqq.) and those involved in causal, or action-related circumstances (e.g., agent, patient, instrument, etc.; cf. Fillmore 1968). Most thematic role theories make use of a mixed set of roles (e.g., LFG, Government and Binding theory, and Construction Grammar, among others). In proposals in which generalized thematic roles are used, these roles mostly encompass both spatial and actional role types (e.g., Dowty's (1991), Primus' (1999), and Ackerman & Moore's (2001) proto-roles, and van Valin's (1999) macroroles). Finally, there have been a number of proposals in which both kinds of roles were partitioned into a thematic (or spatial) and an action "tier", thus making their different status explicit (e.g., Jackendoff 1987a, Culicover & Wilkins 1986, Grimshaw 1990).

Theories dealing with the linking problem must explain how particular thematic roles of the arguments in a semantic representation are linked to positions in syntactic representations. Scenario (1.9) illustrates that this is not enough. Linking theories must not only explain how language users assign particular "meanings" to utterances and construct utterances from particular "meanings", they must also explain the criteria by which particular thematic role assignments come about, namely:

(i) what criteria make Nicole an agent in (1.9a) but an experiencer in (1.9b) and
(ii) what criteria let the milk remain a theme across both verbalizations?

Note that (i) concerns all action-related thematic roles, while (ii) concerns spatio-temporal thematic roles. My claim is that answering (i) requires use of fundamentally different criteria than answering (ii). I will argue that (i) can only be answered by recourse to those non-conceptual contents that originate in socioculturally conventionalized, internalized action and attribution habits enacted within a culture, and that (ii) can be answered by recourse to those conceptual contents that originate in perception. This is the reason why Jessica and Sarah in (1.9) perceive the same (exemplified by the theme) but make different attributions (exemplified by the agent vs. experiencer attribution). One crucial claim I will defend is that action-related notions like those underlying agentivity (roughly: intentions) are not perceivable and thus constitute a different kind of knowledge than perceptually based concepts. The latter are thus underspecified. This has huge consequences for a conception of semantics and the syntax-semantics relationship. These considerations can be condensed in the following questions:

- What is the respective ontological status of spatio-temporal and action-related thematic roles, and what is their position in a linking theory?

On the basis of the assumptions outlined above I will try to demonstrate how an adequate treatment of traditional linking phenomena like those in (1.1) to (1.3) and (1.9), among many others, is possible.

1.4 The structure of this book

Part I presents my basic assumptions about the syntax-semantics relationship as a competence of language users and compares them with those of the two paradigms that presently account for most theoretical linguistic projects, studies, and publications. I refer to them as Chomskyan Linguistics and Cognitive-Functional Linguistics. As I will argue, both approaches reduce their subject matter in a way that impoverishes the linguistic^{o} competence in crucial respects that have to be taken into account. It will be claimed that the competence in question consists in the ability to successfully interact verbally by means of verb-complement structures, which implies the well-formedness and situational appropriateness of what is uttered. For instance, while both (1.9a) and (1.9b) are clearly well-formed, only (1.9b) seems to accord to actual conventions of attribution and is thus an appropriate utterance in this situation. Important aspects of this competence thus concern issues of use and supra-individual matters, i.e., questions about whether actual utterances are appropriate with regard to the contents. I will show that the abovementioned approaches do not provide the means to accommodate this, creating the need for an alternative approach.

While considering these two approaches (sections 2.1 and 2.3), an alternative proposal will be sketched in section 2.2, using the notion of "research programme". The programme developed and the model embedded within it are outlined in the corresponding sections and are intended to rest on generally acceptable metaphysical assumptions. Thus, part I deals mainly with questions of the philosophy of science. Nevertheless, the model underlying the research programme gives structure to the procedure followed throughout the rest of the book, since it identifies the undertaking as multidisciplinary, following from the central roles of perception and action/attribution. This means that approaching the competence of relating form to content as characterized above requires looking into these sub-competences first, since the former draws upon the latter.

Traditionally, different scientific disciplines deal with these sub-competences, the most important ones being cognitive psychology, cognitive neuroscience, linguistics, philosophy, sociology, and social psychology. The way in which these individual scientific disciplines talk about their subject-matters is quite heterogeneous with respect to their basic assumptions on a meta-theoretical, i.e., research-programmatic level. Part I therefore concludes with the formulation of an action-theoretic vocabulary and taxonomy (section 2.4). The notions developed there are grounded in those differentiations that are enacted in everyday life, i.e., they are lifeworld differentiations. How we differentiate things, features, events etc. in our everyday life in an intersubjectively traceable way is considered here to be the ineluctable instance for the validity of theoretical distinctions. Crucially, this vocabulary serves as the guideline for how to talk about the subject-matter of each of these disciplines.

Part II and chapter 3 then deal with the sub-competences that have been identified as underlying linguistic^{o} competence. They concern the use of perception, identification/categorization, conceptualization, action, attribution, and the use of linguistic^{o} symbols. Section 3.1 in part II deals with perception and thus with cognitive psychological matters. The significance of perception for the linguistic^{o} competence may be an indirect one in that perceptual mechanisms are sustained in conceptualization, but it cannot be underestimated for the same reasons. Figure 1.1 indicates the central place of conceptual

contents in the syntax-semantics relationship. In particular, two crucial properties of perception will be discussed: that it consists of a bottom-up part and a top-down part, and that the output of perception is underspecified in the sense that what we perceive is not informative with respect to actional, i.e., socially relevant matters. (This is what scenario (1.9) illustrates.) The sections on perception to some degree anticipate the characterization of conceptualization in section 3.2 because the latter will be reconstructed as simulated perception. The property of underspecification is thus sustained in conceptualization, too. Taking a conceptualist view of reference, this characterization of concepts becomes highly relevant: If utterances encode concepts and concepts are underspecified with respect to those matters that are most important for everyday interaction, one wonders how verbal interaction can (actually) be successful. Here is where action competence and attribution – matters of philosophy, sociology, and social psychology – come into play (the non-conceptual contents referred to above). I will show that natives speakers act and cognize according to particular socio-cognitive parameters, on the basis of which they make socially relevant attributions (just like Jessica and Sarah do in (1.9)). These in turn specify what was underspecified about concepts beforehand. (Nicole's deed in (1.9) is underspecified with respect to matters of agentivity. Jessica's and Sarah's utterances encode the same perception, but differ in the encoding of attributions, thus compensating for the underspecification.) In other words, actional knowledge including attribution must complement concepts in order to count as the semantics underlying linguistic^{o} utterances. How this works is illustrated in a little case study involving German dialects that concludes these sections.

Sections 3.3 and 3.4 develop a descriptive means for semantic contents not using predicate-argument structures. I present the inherent structural organization of concepts and demonstrate how the spatial and temporal aspects of conceptualization can be systematically related to the syntactic structures underlying utterances, using the example of German. That means these sections deal with cognitive psychological matters but at the same time ask how these matters are systematically related to linguistic^{o} structures. In particular, I will argue that conceptualization is organized by means of trajector-landmark configurations which can quite regularly be related to parts of speech in syntactic constructions using the notion of diagrammatic iconicity. This will be illustrated by many examples. Questions of relativity and universality will also be discussed in this context. Given a diagrammatic mapping and conceptualization as simulated perception the utterance thus becomes something like an instruction to simulate a perception. (That is why (1.9a) and (b) encode the same conceptual/perceptual contents. The difference between them lies in the encoding of non-conceptual contents: attributions). I will also discuss what role this motivated mapping plays in acquisition and what the consequences of violations of motivated mappings are, how they come about, and whether they derogate the interactive function of language or not. Because of the instruction rationale, I would like to give the name "Instruction Grammar" to the framework presented here.

In part III, in which I turn to the core of the linking competence I try to demonstrate the advantages of the present theory of that competence over competing theories on a more concrete, i.e., phenomenon-oriented level. Even if my objections to Chomskyan and Cognitive-Functional Linguistics are considered serious and justified, they do not suffice to legitimate a new research programme at the level of philosophy of science alone, without

taking the explanatory power of those approaches into account at the level of theory. Even if the premises of a new research programme might be less problematic, the theories developed in accordance to it should not give up certain insights that are the result of the existing frameworks. Looking at the (incremental) interpretation and production of utterances, I will show how the conceptual and actional notions and devices developed in parts I and II supply producers and interpreters of utterances with the sub-competences to successfully interact verbally in a well-formed and situationally appropriate manner. Section 4.1 deals with the question of what the formal constituents of utterances/constructions contribute to the building of a concept from an utterance. In this context a theory of the German dative is presented, based on the theoretical notions developed throughout this work. Section 4.2 sketches the non-formal properties that reduce the remaining underspecification. In this context one of the most fundamental and important cognitive properties of language users is uncovered, namely their need to find the cause of any event they are cognizing about. I will then outline the consequences of this property for language production and comprehension. Section 4.3 lists the most important linking schemas for German on the basis of the most important constructions, i.e., motivated conceptualization-syntactic construction mappings, and then describes in a step-by-step manner how – from the utterance-as-instruction-for-conceptualization perspective – such an instruction is obeyed, and how such an instruction is built up from the perception of an event, respectively. The latter will make use of the scenario in (1.9). The last section, 4.4, is dedicated to a discussion of some of the most famous, most widely discussed, and most puzzling linguistic^{o} phenomena which theoretical linguists traditionally deal with (like those in (1.1) to (1.3). In discussing the formal aspects of the linguistic^{o} competence, examples from German are used.

For better or worse, setting up a research programme is associated with the reinterpretation and invention of theoretical terms. I have therefore put together a glossary at the end of the book. Additionally, appendix A shows how some central terms from traditional syntax-semantics linking theories may be reconstructed using the present theory.

The prominent role of perception in the theory proposed here and especially the role of the visual modality also finds its expression in the frequent use of illustrative figures. In particular, schematics of conceptual structures and of conceptualization-construction linking schemas will be of some importance. Although the symbolic conventions are separately listed, they will be developed throughout the chapters in conjunction with the theoretical notions they symbolize. The schematics used in this work are intended to be somehow iconic with respect to “real” events. This is due to the nature of perception and the close relationship between perception and conceptualization. I have also renounced any “syntax” of conceptual structure as is known from the work of Ray Jackendoff, for instance, because I claim conceptualization works modally, not by symbol manipulation. This makes a high degree of formalization difficult but I deem this unavoidable. But, one step at a time, let us begin with the research programme.

Part I: Research programme

Introduction

The topic of part I and its sub-parts is the programme underlying the proposal outlined in this book about the relationship between semantics and syntax.[10] In particular, the background assumptions of the programme shall be presented and distinguished from alternative proposals. A programme without such prior, absolute assumptions seems, firstly, impossible and, secondly, ignores actual and previous research. The programme pursued here builds on a number of research results from a number of scientific disciplines. This is to a large degree due to the topic, since language and speech as objects of research extend to the fields of several disciplines. Any one of them makes proposals and contributes to the explanation of the phenomena in question. With respect to the history of science, it has often been ideas or complexes of ideas (like that of dialectic materialism) or technical achievements (like that of the digital computer) which have brought proposals and contributions of one or the other scientific discipline to the center of attention of the others and which have indicated new directions of research. Discipline-internally, i.e., in linguistics, such ideas or achievements are adopted under certain conditions and may, under further specific conditions, lead to paradigm changes (cf. Kuhn ^{2}1970 on paradigms) or may bring about new research programmes (cf. ten Hacken 2009 on research programmes). Presumably, the last turnaround of this type took place within theoretical linguistics from the end of the 1950s to the beginning of the 1960s. It was at that time that linguistic structuralism of the post-Bloomfieldian type came into crisis (cf. ten Hacken 2009: 176ff.), when Chomsky (1959) sounded the death knell for linguistic behaviorism and when his alternative proposal required, as it developed, a representational theory of mind (cf. Horst 2005, Pinker 1994: 64–73) for which the works of Alan Turing (e.g., 1950) on "thinking" and "learning" machines promised to provide the means. The assumption behind the novel syntactic analyses of Generative Grammar was one of a computational mind that manipulates formal symbols.

Since about the end of the 1980s, however, a relatively coherent, identifiable research programme, known by its followers as either "Cognitive Linguistics" (cf. Janssen & Redeker 1999: 1ff., Evans & Green 2006: 3) or "Cognitive-Functional Linguistics" (cf. Harder 1999b, Langacker 1999: 23, Tomasello 2000: 64, Nuyts 2005), has been developing. This research programme will here henceforth be referred to as "CFL.[11] Adopting ten Hacken's (2009) terminology, this programme seems incommensurable with respect to the concept of linguistics put forward by Chomskyan Linguistics (henceforth CL).[12] Although a definitive program of CFL has not yet been formulated, its boundaries are relatively well determined (cf. the edited volumes, programmatic works and overviews by Janssen & Redeker 1999,

[10] The term "programme" is used here in a theory-neutral sense. The term "research programme" will be introduced in chapter 2.2.

[11] Most importantly, one has to note that there was intensive work in this kind of linguistics prior to the establishment of a coherent research programme, or, one could say, there was a pre-paradigmatic phase. This period from the 1970s to the end of the 1980s can roughly be identified with the works of George Lakoff, Leonard Talmy and Ronald Langacker.

[12] That is, their terminologies are founded on such different metaphysical assumptions that they can hardly be reconciled.

Evans & Green 2006, Evans & Pourcel 2009, Ungerer & Schmid [2]2006, Croft & Cruse 2003, Geeraerts 2006a, Geeraerts & Cuyckens 2007a, Kövecses 2006, Kristiansen et al. 2006, Kristiansen & Dirven 2008, Dirven & Verspoor 1998, the Cognitive Linguistics Research monograph series, the journal Cognitive Linguistics[13], among others). Not only the presence of textbooks in CFL (a sociological factor) but especially the manner in which scientific knowledge is passed on to upcoming Cognitive linguists points to the conclusion that it constitutes an identifiable research programme. Concerning the latter point, Cognitive linguists do not try – at least, usually do not try – to legitimate their programme by separating themselves from other programmes, but they suggest that there is already a readership that is interested in the topic for its own sake and thus do not need to be "converted" first. Today, two more or less isolated programmes in theoretical linguistics seem to coexist: Generative Grammar of the Chomskyan type (i.e., Government and Binding or Principles and Parameters theory and the Minimalist Program) and CFL.[14]

When the subject matter of any scientific work overlaps with that of CL or CFL, then this work will have to deal with their programmes and their underlying assumptions and it has to take a stand relative to them. The present work, to anticipate the later chapters, shares some views with CFL but disagrees with it in some others, while it disagrees with CL more fundamentally. The following sections comprise a detailed outline of the programme pursued here and the discussion of its central assumptions.

- Chapter 2 introduces the central sub-competences underlying the subject matter of this book: the linking competence. It outlines how the discussion of these sub-competences gives structure to the book. Section 2.1 introduces the notion of "research programme"; section 2.2 presents a new research programme in the context of which the subject-matter is explored. This happens by contrasting it with the goals of CFL. The excursus to CL in section 2.3 demonstrates that it is not available as the starting point for my undertaking, either. Section 2.4 introduces fundamental concepts associated with the research programme chosen.[15]

2 Research programmes and the linking competence

I deem that sociocultural praxis I am living in as well as that of any other human to be inconceivable without verbal interaction. By means of verbal action we organize and coordinate non-verbal action which is a constitutive part of such praxes (cf. Janich 2006, Gärdenfors 2002, Tomasello 2008, Everett 2013).[16] In addition to their coordinating and organizing functions, verbal actions are themselves, as performatives, constitutive of our

[13] The CLR series and the journal "Cognitive Linguistics" are sponsored by the International Cognitive Linguistics Association (ICLA). See <http://www.cognitivelinguistics.org/index.shtml> for further information.
[14] The dissension between Chomskyan Linguistics and Cognitive-Functional Linguistics still seem irreconcilable (e.g., Newmeyer 2003).
[15] Paragraphs explicating the structure of upcoming chapters and integrating larger parts into the research programmatic context will be indented and marked with an arrow.
[16] For a more detailed characterization of these terms see section 2.4.

living together (cf. Austin 1972). Anyone who wants or claims to be or to become a member of a sociocultural praxis must necessarily learn or acquire the language spoken in the particular culture. As famous exceptional cases indicate, a culture as reference point is even a necessary condition for the acquisition of a language (cf. Curtiss et al. 1974, Klann-Delius ^{2}2008: 74ff.). Children like the famous girl Genie who were not raised in a human community do not acquire the competence to interact verbally until they have entered a community – even though in a different way from the "usual" (i.e., non-pathological or based on a missing linguistic^{o} socialization) course of events.[17] It is a remarkable fact that we – as mature, autonomous subjects in a community – act verbally, i.e., we pursue purposes and manipulate the objective world around us by speaking, and due to the status of speaking as acting we could principally desist from acting verbally, while we cannot desist from acquiring the competence to speak, given the appropriate circumstances. Consequently, from the beginning a biotically[18] rooted capacity appears to be another necessary condition for the acquisition of a language besides the already existing cultural praxis (cf. Bierwisch 2008: 324, Klix 2003, Tomasello 2008). Neither condition can easily be placed in the relation between phylo- and ontogenesis, even less so, if one factors the cultural aspects out of phylogenetic considerations, i.e., if one attempts to write a "natural history" of language.[19] In any case the aforementioned conditions together contradict both radical "nature" and "nurture" proposals. In addition, this opposition seems to be nothing more than a hackneyed dichotomy today (cf., for instance, Johnson & Lakoff 2002).

By "capacity" I mean the (condition for the) possibility of the development of a competence. Human beings like Genie indeed have the capacity to develop a linguistic^{o} competence, but the development has not been actualized in the conventional way. In the case that it becomes actualized, the linguistic^{o} competence is acquired. This – the actualization of the linguistic^{o} competence – is identical to the ability to interact successfully verbally within a communicative praxis. Success, as will be shown, thus comprises both grammaticality and appropriateness standards.

In this context there appears to be an interesting asymmetry between language and other cognitive competences. Man, as a species, has the capacity to develop a linguistic^{o} competence as well as to develop the competences of attending to something, employing visual imagery, memorizing something, solving problems etc. But while the development of the latter competences is independent from the presence of a community – Genie apparently has developed these competences –, the linguistic^{o} competence will not develop in a way that is comparable to the "usual" case. Thus, it cannot be actualized in a comparable way. This fact may lead one to the conclusion that language, because it is somehow special in this respect, should be viewed differently from other cognitive competences, and that linguistic^{o} competence should be modelled differently and independently from other cognitive competences. But this viewpoint ignores the fact that the structures of language are to a high

[17] On the linguistic^{o} development of Genie cf. Curtiss et al. 1974, Pinker 1994, Sampson 2005.

[18] While in speech about psychic and psychological, physical and physiological phenomena the difference between object-language and meta-language is sometimes respected, the speech about biological phenomena is an exception. Unfortunately, the meaning of „biological" often comprises both 'concerning the science of life forms' and 'concerning life forms'. Here, "biotic", even if it sounds strange, is intended to mean the latter, while "biological" is used when the science of life forms is meant.

[19] This is the case within the search for the origins of the language faculty within the Minimalist Program (cf. Hauser, Chomsky & Fitch 2002).

degree made possible by the working of other cognitive capacities and competences as well as by further biotic and cultural factors which pervade them (cf. Duranti 1988, 1997, 2004b, Foley 1997, Tomasello 1992, 1995, 2003, 2008, Tomasello & Farrar 1986, Tomasello, Kruger & Ratner 1993, Talmy 2000, Evans & Green 2006: 27ff., Palmer 2000, 2007, Ochs & Schieffelin [2]1994, Everett 2013).

As a consequence, the above-mentioned biotic capacity is, on the one hand, only a vague disguise of complex interdependences between different cognitive capacities and competences and, on the other hand, intermingled with cultural aspects in a complex and non-transparent way, where aspects of living together have a bearing on cognitive structures and operations. From the set of phylo- and ontogenetic, natural and cultural, social and individual, psychic and pragmatic conditions on the acquisition and the actualization of language(s) and speech, the following shall be emphasized as belonging to my basic assumptions:

(B A1)[20] the "possession" of conceptual contents (cf. the relevant literature on cognitive psychology, e.g., Eysenck & Keane [5]2005, Engelkamp & Zimmer 2005, Solso 2005, Sternberg [4]2006).

This requires:

a) a perceptual apparatus for sensing and perceiving as well as structuring the environment, i.e., functioning sense organs and in particular a visual apparatus which in several respects structures language,

b) a "knowledge" structure constituting semantics which functions on the basis of perception and action, i.e., a conceptual structure in which "knowledge" is gained via perception and actional knowledge (i.e., from a sociocultural praxis) which complements it. How both conceptual and actional knowledge components are organized and combined constitutes the basis for the association of knowledge with structured signals;

(B A2) the competence of intersubjectivity, i.e., the competence of seeking access to conceptual contents (and thoughts) of others and of providing others access to one's own conceptual contents (and thoughts), respectively (cf. Schutz 1967 [= Schütz [2]1981], ch. 3; Schütz & Luckmann 2003, ch. IIB, VA).

This requires:

a) the competence of joint attention (cf. Bühler [2]1976: 27, 1982, Tomasello 1999: 56–93, Tomasello 2008), through which a communication channel between interactants can be opened, which is indispensable for providing another person access to one's own conceptual contents (and thoughts) which are *per se* private, and for acquiring access to another's conceptual contents (and thoughts), respectively,

b) a common ground, by which that is meant "what is 'relevant' to the social interaction, that is, what each participant sees as relevant and knows that the other sees as relevant as well – and knows that the other knows this as well […]." (Tomasello 2008: 74ff.),

c) the need for cooperation which is the motivation for non-verbal interaction as well as for the sharing of conceptual contents (and thoughts) (Tomasello 2008: 82ff.,

[20] "(B A*n*)" serves as abbreviation of "Basic assumption number *n* of the program pursued here".

Tomasello 2009); verbal interaction is in the normal case not independent of purposes but serves the satisfaction of one's needs and the realization of purposes, respectively (cf. Janich 2001: chapter II, Janich 2006: 99f.);

(B A3) the competence to use signs as means of purpose-rational action (cf. Tomasello 2009). This requires:
a) the competence to match situationally-based percepts[21] with concepts and to designate the latter by means of syntactic structures,
b) the competence to designate concepts which are independent of the situational context by means of syntactic structures,
c) the competence to segment signals and to classify the segments by associating conceptual contents with them,

(B A4) action competence, comprising all conditions of action, action understanding, and attribution (cf. Heider 1958).
Among these are:
a) autonomy to set purposes (cf. Janich 2001: 63),
b) rationality of means-end choice (cf. Janich 2001: 63),
c) the acquisition of an ascriptivistic action concept (cf. Janich 2006: 80ff.),
(d) control over one's own actions, in part based on the perception and a "model" of the environment (i.e., on basis of points (B A1) and (B A2) above; cf. Engelkamp & Zimmer 2005: chapter 7, in part based on points (B A4a)-(c)).)

None of these factors is sufficient for an explanation of linguistic^{o} competence. Furthermore, none of the competences mentioned is probably possible without presupposing one or more aspects of one or more of the others. But all of them are nevertheless necessary conditions. Moreover, few of them (even if the important ones) are necessary to acquire the other cognitive competences mentioned, namely those mentioned under (B A1).
Apparently, the list above invites one to a discussion about which scientific disciplines should be responsible for the subject-matter. As an approximation, points (B A1) and (B A3) (and parts of (B A2)) lie in the traditional scope of psychology, cognitive or evolutionary, although philosophers might claim to contribute to point (B A1), sociologists to point (B A2), and semioticians to point (B A3). The topic becomes more complicated when one turns to points (B A2) and (B A4) (but cf. Quine 1951, 1969). While the cognitive aspects mentioned should lie in the scope of psychology, e.g. cognitive or evolutionary psychology, speaking about purposes and all the other concepts taken from a theory of action potentially poses a problem for natural sciences and a naturalized psychology. By naturalism I mean the metaphysical assumption underlying the research programme of a science or scientific discipline, according to which only laws of nature[22] (Hartmann 1993, Hartmann 1998) are effective in their subject-

[21] By "percept" I mean the result of the process of recognition (see section 3.1).
[22] Applying natural laws to some situation s_1 such that another situation s_2 can be predicted requires the subsistence of natural laws to the law of causality according to which the same causes have the same effects (cf. Hartmann 1993: 81).

matters.[23] It is an outcome of the rise of the natural sciences since the nineteenth century that the natural sciences have made even human action their subject-matter. If, in addition, they accept the principle of sufficient reason[24] and if purposes, intentions, decisions etc., i.e., matters of human action, are taken to be "real" in the sense of being somehow physically manifested, then they must be subjected to necessary physical causation. The following shall be the guideline of my overall considerations: The results of those cognitive sciences and neurosciences which make human action their subject-matter will be taken into account to the degree to which these scientific disciplines remain able to claim validity for their own results, depending on their presumptions (cf. Janich 2003). These claims are possible as long as these disciplines respect the relevance of action-theoretic notions and the distinction between object and observer. The assumption of a strict naturalism, i.e., conception of all human "movements"[25] as being subjected to the laws of nature and the denegation of the possibility of action (as opposed to mere behavior), deprives us of the possibility to claim validity for our own theory and research results because we could not have done otherwise than to formulate them. As Janich (2001: 56; my translation) puts it,

> "[t]he main argument against the programme of naturalizing human action, i.e., of making it the exclusive subject-matter of natural scientific explanation is that it is logically incompatible with itself. One would actually have to see such behavioristic, or naturalistic, research not as a purpose of the scientists pursuing this program but one would have to explain it causally. This explanation is absurd, if only it is so complex that no one has ever attempted to put it into practice. But even if it were possible to do so, the crucial feature of any scientific explanation would fall victim to it: the differentiation between valid and invalid, between true and false explanations. Because, if insights were only products of functions of organisms which are described by natural scientific methods, then the same would be true for errors, mistakes, misapprehensions etc., too. That means natural scientific descriptions and explanations of the functioning of the human organism do not supply a differentiation between true and false results. On the contrary, they must claim this ability of differentiation from the beginning. In fact (and reasonably), natural scientists do not waive claims of validity for their results. The program of naturalizing human action is therefore as a matter of principle doomed to fail."

The subject of science, that is, a person of whatever profession engaging in the exploration the cognitive powers of *homo sapiens*, explores him-/herself as object of his/her research. Whatever his/her claims towards his/her object are, they are therefore claims concerning him-/herself (cf. Janich 2006: 393ff.). As Hartmann (1998: 4) puts it (generalizing considerably), the naturalist asserts that any event, including human action, is a "natural" event, i.e., it is describable and explainable by theories of natural sciences in terms of natural laws. Any existing theory on the topic is thus an alternative to one's own theory with (or without) equal claims for validity, since all those theories are necessary ones in the sense of laws of nature.

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[23] These complications may result from ideas of the human species which are mostly implicit and seldom explicit in naturalistic theories. Keupp (2001: 37; my translation) states with respect to psychology that "[a]ll psychological theories and statements are based on ideas of the human species though they are seldom made an issue and reflected upon. When in today's psychological jargon notions like "storage" or "information processing system" are used, then the human mind is conceptualized by means of a computer metaphor. The use of metaphors can be illuminating [erkenntnisfördernd] but the metaphor must not be treated like "the object" itself. Otherwise it becomes a myth. Metaphors are tentative approximations to a field that is yet unexplored but one must be aware of this tentativeness."

[24] "Every event has a cause." (Hartmann 1993: 81f.; my translation).

[25] See section 2.4 and the event taxonomy proposed there. It suffices to say here that movement applies to any instance of vegetative or somatic behavior or action of living beings.

An external observer with a "God's eye view" on what happens in the world is not possible, since the observer/theoretician is always part of the world he/she describes and as such he/she and his/her theory are subject-matters of themselves (cf. Gergen 1973, Pepitone 1981 on arguments against a naturalized psychology). In this work, a rather sceptical position shall be taken with respect to the principle that every event has a cause, since this is neither an *a priori* truth nor a natural scientific statement (cf. Hartmann 1993: 82ff.). Because of this the starting point of my considerations is a functioning communicative, sociocultural praxis in which everyone is simply forced to overtake responsibility for what he/she is made responsible for by other members of this praxis, just as if there were no alternative other than to presuppose the possibility of freedom of choice, setting of purposes, claims for validity etc. (cf. Janich 2000, 2006, 2009, 2010, Sturma 2006, and section 2.4 of the present work). This is neither the denial that mental states and processes are accompanied by neuronal states and processes nor the denial of there being natural laws. It is a sceptical position towards the universal validity of the principle of sufficient reason which is in the first instance not a law of nature but (only) a methodological norm due to specific goals of research (cf. Hartmann 1993, 1996).[26]

With that, the upper boundaries of the subject-matter of natural scientific methods are set for the theory of the semantics-syntax relationship presented in this work. A purely biological or evolutionary or, in brief, naturalistic explanation for the phenomenon of language and acting through language shall therefore not be attempted. The position of Chomsky (e.g., 1980: 106ff.) is explicitly a naturalistic one and is therefore not available as an approach to the subject-matter in question. It is remarkable in this context that, as in CL, the naturalistic stance comes along with a gradual reduction of its subject-matter which, in the case of the narrow language faculty (FLN) (cf. Hauser, Chomsky & Fitch 2002), today encompasses little more than recursion which is, additionally, from an evolutionary perspective considered to be only secondarily a matter of language, since it is an exaptation, not an adaptation, and therefore might have developed for purposes other than communication (cf. ten Hacken 2009: 114ff., 258ff. for an overview of evolutionary questions concerning FLN). Chomskyan-style theory of grammar thus excludes pragmatic competence and praxis-based performance at the level of the individual (cf. Chomsky 1980: 224 on grammatical competence vs. pragmatic competence; Chomksy 1965: ch. I, 1 on competence vs. performance), and the non-genetically determined, non-evolutionary based aspects of the faculty of language at the level of species from its subject-matter, for methodological reasons (cf. Chomsky 1980: 38).

In sum, the subject-matter of this work – the semantics-syntax relationship and its relation to the individual's competence of verbal interaction – shall not be accounted for in a natural scientific approach, but in one that starts from within a functioning communicative praxis and that nevertheless includes insights from natural and cognitive sciences as well as from the humanities (in particular philosophy).

[26] Criticizing the naturalistic programme from a slightly different perspective, Keupp (2001: 39; my translation) states that "large parts of psychology which is the central discipline concerned with the individual are still led by the assumption – due to a naturalistic misunderstanding – that they could formulate statements about the individual which are ahistorical and universally valid. This is only possible for the basic biological-natural processes of psychical functions (e.g., for the physiological-anatomical conditions of perception) but not for the qualitative dimensions of the psychical which concerns its contents (e.g., perception is always social perception, i.e., sensory cognizance [Erkenntnis] in the context of socioculturally shaped categories of perception."

Coming back to conditions (B A1) to (B A4) above, which were conceived of as conditions for the development of a linguistic^{o} competence, one has to shift the perspective to make them the starting point for an investigation in the semantics-syntax relationship as manifest in the language user. Although these four conditions have been introduced as concerning the development of a linguistic^{o} competence, in what follows the focus will lie on the reflexes of the functioning of these competences in the functioning of language as it is used. In other words, the list above is derived from the factors that show up in the functioning of linguistic^{o} structures and the structures underlying them, especially in what is known in theoretical linguistics as "argument-structure" and its verbal realization.

As a consequence, the necessary parts of a theory of the syntax-semantics relationship can be listed. Drawing from numerous proposals from numerous scientific disciplines and sub-disciplines, a consistent account of the topic requires

- an account of perception and conceptualization (sections 3.1 and 3.2),
- an internalized action theory (attribution) concerning actional knowledge that is imposed onto conceptual knowledge (section 3.2),
- an account of how we understand others and know their interests and goals on the basis of acquired social and conceptual competences (section 3.2),
- an account of linguistic^{o} utterances, in particular how they are build up, how they relate to what we perceive, conceptualize, and know about matters in the world and other persons (sections 3.2.3 to 3.4),
- a discussion of the classical problems of the syntax-semantics relationship from the perspective of the present proposal (part III).

Together, these constitute the foundations of Instruction Grammar. How the name is motivated will be shown in Part II.

2.1 Research programmes

2.1.1 On research programmes in general

In order to integrate the considerations above into a consistent framework it is necessary to create a level of abstraction at which this becomes possible. The notion of "research programme" is intended to provide this level.

The term "research programme" is taken from the work of ten Hacken (2009) in which he outlines the research programme of "Chomskyan linguistics". The notion is derived from that of "paradigm" established by Kuhn (^{2}1970).[27] One of the most important features of paradigms is their dependence on scientific communities. "Scientific communities can and should be isolated without prior recourse to paradigms; the latter can then be discovered by scrutinizing the behavior of a given community's members." (Kuhn ^{2}1970: 176). Sociological

[27] The term as used here in the sense of ten Hacken is not identical with Lakatos' (1998) concept of "research programme".

factors are necessary for Kuhn's framework, since paradigms are defined as what a given community shares. They are thus existentially dependent on several agreements among members of a community. Such a characterization of paradigms allows Kuhn to investigate developments in the history of science, especially revolutions, i.e., the replacement of a paradigm by another one due to a crisis in the former (cf. Kuhn ^{2}1970: 92ff.). In Kuhn's account, then, paradigms depend on intellectual as well as social/sociological properties.
In the present work, I am not primarily interested in the course of science in general, changes of paradigms or sociological matters concerning scientific communities but in the intellectual properties of what could potentially be a paradigm. Kuhn provides an answer to the question of what has to happen to make certain intellectual considerations to become a paradigm. The answer lies in sociological factors. I concentrate on the intellectual considerations alone and can only claim that it be generally acceptable to researchers within linguistics and in related fields. What is needed, then, is some equivalent to a paradigm which works independently of sociological factors. This is what ten Hacken (2009: 18) provides with his concept of research programmes.

A research programme is constituted by a "model" consisting of a set of assumptions which are able to set the "empirical cycle" in motion and to circumvent its inherent problems (cf. ten Hacken 2009: 6–19). The empirical cycle is the mechanism that makes scientific insights possible.

The necessary components to set it "in motion" are "observable facts", "observations", "empirical laws", and "theories". Each of these notions will be characterized in turn. The "setting in motion" of the empirical cycle can be described as follows: Someone (e.g., Eratosthenes) makes specific observations (e.g. about heavenly bodies), which are extracts of what is generally observable. He notices that there is something systematic, recurrent or pattern-like within the phenomena he observes (an observed, heavenly body *x* is always at point *p* in space at daytime *t*). On the basis of the analysis of his own observations, Eratosthenes formulates an empirical law. Empirical laws are "close" to observations. For instance, the characterization of the orbit on which the body moves along would count as an empirical law. These laws mediate between observations and theories which are more abstract than empirical laws (e.g., a formulation, verbal or other, which gives an explanation of the planetary system and the movements of their parts along orbits). A theory allows further predictions of other empirical laws and other observable facts. At the same time, these observable facts test the theory's validity and may lead to a situation in which the incorporation of new data into the theory improves this theory, let's say theory_1, by modification in the sense that it, as theory_2, now explains a greater range of data (observations). This process is potentially infinite, i.e., the "movement upwards" from theory_1 to theory_n has no logical end. In this sense, the empirical cycle is rather a spiral (ten Hacken 2009: 9).
Simple as it might seem, the idea of scientific progress based on the empirical cycle poses severe difficulties. According to ten Hacken (2009: 11) they can be put in the following way:

"a. Which of the many possible observations are worth recording as data?

b. Which aspects of the selected data should be taken as a basis for a generalisation?
c. When is a theory deep enough to be considered explanatory?"

Why do these points pose difficulties? In the case of (a) the problem lies in the fact that observations are not mere subsets of observable facts and thus have a different status. A tree standing in front of the institute I'm sitting in might count as observable fact, but what I actually observe is dependent on my vantage point. I do not observe the entire tree because I can never see the entire tree. Thus, what I observe is limited. Furthermore, I add information that is not contained in the stimulus, i.e., in what I see. Actually, there are bushes in front of the tree, but I "know" that behind the bushes there is "more" tree than I see. Thus, any act of perceiving involves acts of interpretation and what we observe is not simply given in a unique way (cf. Moskowitz 2005: 22, Solso 2005: 104ff. for a cognitive-psychological explanation of this phenomenon from two different perspectives).
The second problem, (b), is that it is possible to draw an infinite number of generalizations from a definite number of observed data, such that the generalizations are compatible with the data.[28] Each of these generalizations might serve as the basis for predictions of further data and they will certainly predict slightly or completely different data not yet observed. When these data are (made) available, then some of the generalizations can be discarded, as they have been proven to make wrong predictions but the number of possible generalizations will never reach a number that could be coped with. What is required here is a criterion for choosing those generalizations among the possible ones which are "sensible generalisations" (ten Hacken 2009: 13).
Problem (c) concerns the "depth" of explanations and the question of when they are deep enough to count as explanations. The seemingly simple answer to this question is "Never!", because any explanation forces one to ask new questions. In the end, this might be a question of when a scientist is satisfied by the explanation given. Thales might have been satisfied by the depth of his explanation of the rich olive harvest he predicted because it allowed him to prove that a philosopher could easily get rich if he only wanted. Why today's astronomers or astro-physicians are in no way satisfied by the insights they have brought about is a question that only they can answer by recourse to their purposes.
The ostensible simplicity of the empirical cycle thus suffers from threefold indeterminacy. In other words, without additional considerations the empirical cycle alone does not suffice for making scientific progress possible. This is where the research programme becomes relevant, as it is the set of assumptions that circumvents the problems of the empirical cycle while warranting its functioning. That means a "set of assumptions, tacit or implicit" (ten Hacken 2009: 18) must be made independently of the way the empirical cycle works in order to be able to cope with its above-mentioned deficits.
Among the six assumptions gathered by ten Hacken (2009: 35), two play a special role, since they constitute the "model" underlying the research programme. (1) This is firstly "absolute assumptions as a basis for explanations" (ibid.). They correspond roughly to what Kuhn (^{2}1970: 184) calls "metaphysical paradigms". He characterizes them as "shared commitments" to certain "beliefs" which "supply the group with preferred or permissible analogies and metaphors. By doing so they help to determine what will be accepted as an

[28] See also Curd & Cover (1998: 496ff.) on the problems of induction.

explanation and as a puzzle-solution." The exclusion of sociological factors in research programmes leads to the replacement of "shared" by "generally acceptable" and of "will be accepted" by "could in principle be accepted". Thus absolute assumptions lose their normative character. Instead of this they should be seen as generally acceptable. Absolute assumptions have the character of definitions or axioms and are more or less "immune to further questions" (ten Hacken 2009: 35). That does not mean that they are "true" but that they are the starting point for research. An example for such an absolute assumption, in the form of a preferred metaphor, is the mind-as-a-digital-computer metaphor on which much of the cognitive psychological research of the last fifty years is based (cf. Solso 2005: 23f.). Absolute assumptions shall also include what Kuhn ([2]1970: 182ff.) calls "symbolic generalizations" by which he means "those expressions, deployed without question or dissent by group members […]." (Ibid.: 182). This would account for, e.g., syntactic categories like N, V, P, A and the formula by which they can be combined into larger units.

(2) The second factor that is constitutive of the model underlying a research programme is "[c]riteria for selecting relevant data" (ten Hacken 2009: 35). These criteria should be provided by the determination of what is the subject-matter of one's theory. If I am interested in an ideal speaker-hearer's grammatical competence, his/her performance data are clearly not immediately relevant. Grammaticality judgments seem to be more relevant. In other words, the model as constituted by absolute assumptions and criteria for selecting relevant data should clarify what language is and what aspects of it should be explained (cf. ten Hacken 2009: 36). As this characterization shows, the two factors are closely related in that absolute assumptions in part determine what relevant data are. The model as a whole, then, should provide an answer to question (a) above.

Besides these two factors, certain heuristics have to be developed which must be compatible with the former. These heuristics should enable (3) "the collection of interesting data", (4) the formulation of useful, i.e., sensible generalizations on the basis of observations, (5) "finding plausible explanations for generalizations" (ten Hacken 2009: 35). (6) Finally, criteria have to be formulated on the basis of which different concurring theories based on (1) to (3) can be evaluated.[29]

When looking at the heuristics (3) to (5) employed, one has to look at other research traditions and make use of their insights. For instance, once I have singled out a phenomenon that is worth investigating, this tells me what might be relevant data but not how I can access them. However, I know that the segmentation and classification of utterances allows me to access interesting data. Thus, the requirement formulated in (3) above can be resolved by recourse to generally acceptable "problem-solutions" (Kuhn [2]1970: 187). Requirements (4) and (5) can only be answered by reference to absolute assumptions, i.e., by reference to the goals of research, i.e., by pointing to the plausibility of certain generalizations and explanations at the expense of others with respect to what is investigated for what purposes.

Concerning the evaluation criteria (6), depth of explanation could be measured and be used as an evaluation criterion for concurring theories. When theory A is able to explain phenomenon *x* in terms of its "How?" (e.g., when Thales can explain *that* we have a sun eclipse when one heavenly body takes the position between our own one and the sun), and when theory B is able to explain the "Why?" of the phenomenon (e.g., when Kepler can explain that one

[29] This criterion is also known as „cognitive" or "epistemic values" (cf. Curd & Cover 1998: 210-253).

heavenly body takes a position between earth and sun *because* of the movement of earth and moon along orbits around the sun), then theory B has gained greater depth of explanation. Together with the amount of data that is captured by a theory, depth of explanation can serve as evaluation criterion for the "value" of theories. As the example illustrates, amount of data and the depth of explanation cannot be separated properly but seem to coincide to a certain degree. A further evaluation criterion of theories with the same coverage of data and the same depth of explanation is simplicity (cf. Curd & Cover 1998: 211f.). The theory requiring less "complexity" would then be preferable. It is difficult, however, to explicate criteria of simplicity. Crucially, concurrent theories can only be evaluated when they serve similar purposes, i.e., "value" is dependent on the question of what the theory is for.

2.1.2 The need for a new research programme

Before outlining the details of the research programme put forward in this work one has to consider the question of whether such a research programme is desirable, at all. In the introduction to this chapter the inception and current existence of an identifiable, relatively coherent research programme called Cognitive-Functional Linguistics has been mentioned. The present work shares some of its assumptions. So why should one need another research programme? The answer lies firstly in the fact that CFL is, or has, not yet a definitive research programme. CFL is an identifiable linguistic approach, but it still lacks a full-fledged research programme in the sense outlined. Why this is so is the topic of the present section. The second part of the answer consists of the assumptions that I do not share with CFL.

The fact that CFL lacks a full-fledged research programme and that one shall be presented here does not mean that fulfilling such a gigantic task is intended here. However, as will be shown, once the skeleton of a research programme is acceptable in its general form, it is open to application to any phenomenon that might be interesting. The nature and scope of the subject-matter of the present work requires, in my view, a multi-facetted account, extending to several sub-disciplines of linguistics and other sciences. This requires the setting up of a research programme. In other words, the programme proposed here might serve as a model (in neutral terms) which can be "filled out" in various ways in order to be a guideline for future research. Once the assumptions (necessary for constituting a research programme) are formulated and fixed in a model (in the research programmatic sense), the concrete subject-matter to be investigated, be it verb-complement structures, speech-acts, morphological matters etc., can freely be chosen.

Cognitive linguists are aware of the fact that they do not (yet) possess a unique research programme. This is more or less explicitly stated in several "programmatic" works. Consider the following quotation.

> "Cognitive Linguistics, when considered in the light of this metaphor, takes the form of an archipelago rather than an island. It is not one clearly delimited large territory, but rather a conglomerate of more or less extensive, more or less active centers of linguistic research that are closely knit together by a shared perspective, but that are not (yet) brought together under the common rule of a well-defined theory." (Geeraerts 2006b: 2)

One can paraphrase this statement in terms of the research programmatic notions introduced in section 2.1.1 above. The "shared perspective" corresponds to elements of "absolute

assumptions" which actually constitute an important, but by itself non-sufficient, part of a research programme. This shared perspective exists and is explicated in many works, e.g., in the one from which the above citation stems. They contain all those assumptions which determine the boundaries of the programme and what its main subject-matter is. The citation also says that those Cognitive linguists sharing a perspective on what they are doing do not work "under the common rule of a well-defined theory", that is to say "under a research programme". A research programme would be defined as being constituted by a model of how to handle the empirical cycle such that this programme is generally acceptable and actually generally accepted by those doing Cognitive-Functional Linguistics. It would comprise all the assumptions implicit or explicit in all the "centers of linguistic research" presently comprising the Cognitive-Functional Linguistics "enterprise" (Langacker 1999). Furthermore, one can read the above passage as establishing a contrast between "shared perspective" and "well-defined theory". In other words, some shared absolute assumptions are not sufficient to constitute a full-fledged research programme. It follows that the word "yet" in the penultimate line expresses the desirability of such a research programme. The need for a research programme for Cognitive-Functional Linguistics is obvious.

This is not, however, an answer to the question of why such a skeletal research programme should be outlined in the present work on the linking competence. This must be justified separately.

The need for a research programme will be justified by means of a comparison of these requirements with the absolute assumptions so far explicated within Cognitive-Functional Linguistics. There is general agreement within CFL that language is "an instrument for organizing, processing, and conveying information" (cit. in Geeraerts 2006b: 3). This might serve as the starting point for further questions. What is obvious, however, is the primacy of "meaning" in this statement and therefore in Cognitive-Functional Linguistics as a whole (cf. Geeraerts & Cuyckens 2007b: 5). "Information" serves as a non-technical paraphrase in this statement.

First, one could ask what sort of "information" this is, how it is organized and how it is acquired. In Cognitive-Functional Linguistics, the information conveyed by means of verbal communication is of a conceptual kind, i.e., conceptual contents in speakers' minds (Langacker 2008a: 27). One could summarize this in the following statement:[30]

(CFL A1) "Semantic structure is conceptual structure." (Evans & Green 2006: 157).

"This principle asserts that language refers to concepts in the mind of the speaker rather than to objects in the external world." (Ibid.). Those concepts that are associated with a phonological form (and are thus part of the language) are only a subpart of all concepts in the individual's mind. Single, isolated concepts are necessarily underspecified. Consider the adjective *safe* and the concept SAFE to which it refers. One has only a vague concept about how it should be characterized. The word can occur in multiple contexts:

[30] In what follows, "CFL A*n*" stands for "absolute assumption number *n* within Cognitive-Functional Linguistics" in the research programmatic sense (see chapter 2.2.1). "C" stands for corollaries of these assumptions.

(2.1) *The child is safe.*
(2.2) *The place is safe.*
(2.3) *The pistol is safe.*

The word *safe* "means"[31] different things in these contexts. It gets its specific meaning only in the contexts provided by (2.1) to (2.3). It follows that the phonological form /safe/ alone does not carry all the conceptual information that is potentially present in the concept SAFE. The phonological form provides only a "prompt" (Evans & Green 2006: 162) for the construction of meaning in context. This leads to a corollary of (CFL A1):

(C1 of CFL A1) "Meaning construction is conceptualization." (Ibid.).

One consequence of (C1) which becomes obvious in the above examples is that meanings are dynamic and flexible (cf. Geeraerts 2006b: 4, Gärdenfors 1995). Another consequence of this corollary, according to which concepts are underspecified in isolation and serve as prompts only, is that "understanding" a word involves more than just retrieving its content in the sense of that prompt, but that it activates "vast repositories of knowledge" (Evans & Green 2006: 160). The word *knuckle* can only be understood, i.e., one can know what it means only if one is able to conceptualize it relative to the concept of FINGER (cf. Langacker 2000: 7).
This is captured in corollary 2:

(C2 of CFL A1) "Meaning representation is encyclopaedic." (Evans & Green 2006: 160).

The opposite view of the encyclopaedic nature of linguistic^{o} meaning is the so-called dictionary-view, according to which meanings are packages with clear boundaries, i.e., definite descriptions.
The relation between concepts and the external world is a very complex one. For now it should suffice to say that "[m]eaning is not just an objective reflection of the outside world, it is a way of shaping that world." (Geeraerts 2006: 4). Whether I say that *x resembles y* or that *y resembles x* is presumably not due to an objective difference between two situations described but to a difference in how a situation is construed from the point of view of the speaker. This is captured in corollary 3:

(C3 of CFL A1) "Linguistic meaning is perspectival." (Geeraerts 2006: 4).

If the vantage point of the speaker in conceptualizing states, processes, or activities, and in verbalizing them is of primary importance and shows in linguistic^{o} structures, then one would assume that conceptualization is closely connected to our perceptual apparatus. This is expressed in the fourth corollary:

[31] The problem of "meaning" will be mentioned in the introduction to part III. Until then, I presuppose a common-sense notion of "meaning".

(C4 of CFL A1) Meanings are (at least partly) perceptually grounded (cf. Gärdenfors 1999: 21).

This assertion holds that there is a tight relationship between perception and conception, i.e., between how we perceive the world around us and how our "knowledge" in the form of conceptual structure is organized. The perceptual grounding of our conceptual system is likely to answer the question of how the latter is acquired. Furthermore, it leads to another, more fundamental assumption within Cognitive-Functional Linguistics. It is implicit in the assumption (CFL A1) as well as in its corollaries. It holds that our conceptual system has the form it has because we have the bodies we have (cf. Rohrer 2007). The body-dependence of our conceptual system becomes obvious when one looks, for instance, at the realm of color. Our experience of colors depends on which biotic equipment we have as humans. Organisms with other equipment will have color experiences different from ours:

(C5 of CFL A1) Meanings are embodied (cf. Evans & Green 2006: 45).

"The idea that experience is embodied entails that we have a species-specific view of the world due to the unique nature of our physical bodies. In other words, our construal of reality is likely to be mediated in large measure by the nature of our bodies." (Ibid.).
Implicit in (CFL A1) and especially its first corollary are the mechanisms by which concepts are organized, put together and combined to larger units. (C2) to (C5) give a hint as to the nature of these mechanisms. To Cognitive-Functionalists, the most important of these are figure/ground organization (Talmy 2000, I, 5), conceptual metaphor (Lakoff & Johnson 1980, 1999), metonymy (Kövecses & Radden 1998), polysemy (Dunbar 2001), idealized cognitive models/frames/cognitive domains (Lakoff 1987, Fillmore 2006, Langacker 2008a: 44ff.), categorization (Rosch 1999, Tuggy 2007), "windowing" of attention (Talmy 2000, I, 4), and mental spaces and conceptual blending (Fauconnier & Turner 1994, 1998, 2002, Fauconnier 2009).
(CFL A1) and its corollaries concern the semantic part of language. Widening the scope toward the question of how and on what basis meanings are considered to be conveyed leads to further assumptions. To put it differently: What is the nature of the instrument by means of which information is conveyed? Asking this question implies a more inclusive view than that on meaning. It comprises not only the semantic side of language but also the formal one. The formal side of linguistic[o] structures is traditionally sub-divided into phonology, morphology, and syntax. Cognitive-Functional Linguistics respects this sub-division for practical reasons but rejects it as a statement concerning the cognitive status of these levels. Instead of separating these levels on notional grounds, it is generally assumed that the formal sub-systems share fundamental organizational features and thus cannot be conceived of as autonomous structures. This is captured in the so-called "Generalization Commitment":

(CFL A2) Different aspects of language are organized by common structural principles (cf. Evans & Green 2006: 28ff.).

The idea behind the Generalization Commitment is that phonology, morphology, syntax (and, in fact, even semantics and, at least in part, pragmatics) might each involve different units with different properties and different relations among each other, but that they all respect the features of human categorization and other cognitive mechanisms like those mentioned above. Because human categorization concerns not only semantics but also "formal" notions of language, it is not a subpart of (CFL A1) but of (CFL A2) which includes semantic aspects as well.

The Generalization Commitment is closely related to another one, the "Cognitive Commitment" (Evans & Green 2006: 40ff.). While the former asserts *that* linguistic^{o} structures on different levels share organizational principles, the latter asserts that these structures "should reflect what is known about human cognition from other disciplines, particularly the other cognitive sciences […]" (ibid.).

(CFL A3) Language and its structural organization reflect general cognitive principles (cf. Evans & Green 2006: 41).

The Cognitive Commitment thus provides a partial explanation for what is claimed by the Generalization Commitment. If language, i.e., semantics, pragmatics and grammar, is all about cognition and if its levels share organizational structures, then this is unlikely to be accidental. According to the Cognitive Commitment, this is due to the assumption that all levels of linguistic^{o} organization draw from the same resources, namely general cognition and the mechanisms it is constituted by. It follows from this that "language is not an autonomous cognitive faculty" (Croft & Cruse 2003).

What counts for language as a whole, counts for grammar, too. If our "knowledge" is to a large degree grounded in perception (as (C4 of CFL A1) claims), and if our "knowledge" structure manifests itself in any level of language structure (as (CFL A2) and (CFL A3) claim), it follows that grammar is also experientially based in the end, that means it is based on the encountering and performing of actual linguistic^{o} material. In other words, "la langue" is grounded in "parole" (cf. Geeraerts 2006: 6; Saussure 1916: 25/30).

(CFL A4) Language as a whole and grammar in particular are experientially grounded and usage-based (cf. Geeraerts 2006: 5f.).

Admittedly, there is actually no agreement among Cognitive linguists as to the degree to which the workings of syntax are independent of general cognition (cf. Harder 1999a for a proposal of "partial autonomy"; Jackendoff (2002: 270), though not being a Cognitive linguist, proposes the term "semi-autonomous" (see also Jackendoff 1993)).

The assumptions above comprise a substrate of what linguists engaging in CFL share. In developing more specific theories like Construction Grammar, Cognitive Grammar, conceptual blending theory and others, researchers might make additional assumptions or mold those above in a variety of ways. Differences within CFL are possible in numerous ways: How are concepts precisely conceived of (cf. Geeraerts 1999)? What form do they take (cf. Margolis 2006)? What is embodiment precisely (cf. Rohrer 2007)? How do symbols get to "mean" something (cf. Harnad 1990, 2010)? What are the units making up the syntactic

component of language (cf. Evans & Green 2006, part III)? To which degree is syntax self-contained (cf. Harder 1999a)? Are there frames, cognitive domains and idealized cognitive models or can they be reduced to a single concept (cf. Cienki 2007)? Notwithstanding disagreements like these, the above assumptions are the core of what constitutes Cognitive-Functional Linguistics as opposed to "cognitive linguistics", i.e., all research traditions within linguistics as a discipline which conceive of language as a cognitive phenomenon including Chomskyan Linguistics (cf. Geeraerts & Cuyckens 2007b: 4). In sum, the Cognitive-Functional Linguistics enterprise can be described as the attempt to see how far one can get when describing language as a competence drawing from the properties of general cognition. This includes the exploration of how these properties are reflected in grammar.

How can assumptions (CFL A1) to (CFL A4) be related to my own assumptions (B A1) to (B A4) outlined in the introduction to chapter 2?

The accentuation of meaning in CFL is reflected in its basic assumptions. Especially (CFL A1: semantics/meaning as conceptualization) and its corollaries document this. Anticipating my argument, I will argue that there is more to meaning than conceptualization. That means that (CFL A1) will be rejected but its corollaries will be accepted if adjusted. In particular, I subscribe to the assumptions that meaning construction crucially involves conceptualization (C1 of CFL A1: meaning construction is conceptualization) but is not identical with it, that conceptualization (as partially constituting the meaning of utterances) draws from encyclopaedic knowledge (C2 of CFL A1: meaning representation is encyclopaedic), that conceptualization (but not meaning) is perspectival (C3 of CFL A1: meaning is perspectival) because it is grounded in perception (C4 of CFL A1: perceptually grounded meanings), and that conceptualization (but not meaning) is embodied in the sense that how and what we perceive and conceptualize crucially depends on the make-up of our bodies and our perceptual apparatus (C5 of CFL A1: embodied meanings). The assumed gap between meaning and conceptualization that leads to the rejection of (CFL A1) will be shown to originate in the roles of perception and conceptualization on the one hand (B A1), and action (B A4) on the other hand.

My own assumptions obviously do not list equivalents to the Generalization and the Cognitive Commitments in (CFL A2) and (CFL A3), respectively. This is due to my reservation toward the reduction of language phenomena to individual cognitive structures which is closely related to the separation of meaning and conceptualization. The Generalization Commitment asserts that all levels of language work by the same cognitive principles. It has been stated, however, in the introduction to chapter 2 that language is not only a cognitive phenomenon but also a social one, i.e., one that transcends individual matters, while cognition sticks to individuals. In other words, there might be some principles at work in language that are the result of the peculiarities of *per se* supra-individual sociocultural interactions and the origins of which are "not within the head" (Deacon 1997: 452).[32] It is these matters that are captured in (B A4: action competence). However, children learn how to put languages to use, so they must have mastered these principles, if there are

[32] As Deacon (1997: 452) puts it more elaborately: "If symbols ultimately derive their representational power, not from the individual, but from a particular society at a particular time, then a person's symbolic experience of consciousness is to some extent society-dependent – it is borrowed. Its origin is not within the head. It is not implicit in the sum of our concrete experiences." See also Vygotsky's (1962) work on egocentric versus social speech.

any. The question is, then, what kind of "knowledge" is involved in this mastery, and whether it conforms to the "cognitive principles" alluded to in the Generalization commitment. These principles comprise, for instance, categorization and conceptual metaphor (Evans & Green 2006: 28ff.). If my reservations are justified, it must be possible to show that there are principles at work at levels of language which do not conform to these principles of categorization (cf. Rosch 1999) or conceptual metaphor (cf. Lakoff & Johnson 1980). This is precisely what I will try to show in later sections (expecially 3.2). I doubt that one can understand language as an information conveying instrument by viewing it as a phenomenon of the individual cognition alone.

These considerations also concern (CFL A4: language/grammar are experientially grounded/usage-based), i.e., the role of language as a whole and of grammar in particular. In the formulation chosen for (CFL A4), however, there is lack of balance in relation to the other assumptions. All the assumptions from (CFL A1: semantics/meaning as conceptualization) to the first half of (CFL A4: experientially grounded language/grammar) highlight the cognitive aspects of language. But the listing of "usage" seems a bit strange in this context, since it touches on sociocultural praxis and this goes beyond the individual's mind. One could argue that usage in the sense of actual utterances could be reduced to some specific form of perceptual input (e.g., frequency), the latter shaping our concepts of grammatical structures. In this sense, usage can be reduced to the first part of (CFL A4), namely experience. It would thus constitute the sort of experience shaping our grammatical concepts, this being the reason why it is mentioned separately by Geeraerts. But taken seriously, usage is always embedded in a sociocultural praxis and we do not know to what extent matters of this praxis which are not part of the individual mind shape the structure of language more or less independently of the workings of the individual's cognition. This latter consideration is in line with what has been said about the indispensability of a sociocultural praxis for language acquisition. The socioculturally bound sense of "usage-based" thus agrees with my assumptions. The other, reductionist sense does not: Usage is reduced to a sort of experience as substantiating grammatical knowledge (cf. the articles in Barlow & Kemmer 2000, Bybee & Hopper 2001, Tomasello 2003, Bybee 2006, Bybee 2010, for usage-based approaches to knowledge of language). Maybe a closer look on what forms of learning are involved here will be revealing. Is it mere exposure to grammatical forms, taking the form of classical conditioning (cf. Pavlov 1928, 2010), correlated with the priming of certain synaptic connections which is involved in "usage" as the basis of langue? Or are other forms of learning involved here too, for instance observational learning and learning by doing within actual interactions which is always accompanied by an instance giving feedback about the utterances produced (e.g., the mother)? This will also be alluded to in later sections.

A closer look at (CFL A1) to (CFL A4) reveals the high degree to which "meaning" is made dependent on the individual's cognition in Cognitive-Functional Linguistics. All of these assumptions are permeated by the focussing on the individual's cognition. There is no assumption that would be valid for a plurality of individuals while being invalid for only one of them. Should meaning be restricted to the individual's (mostly the speaker's) mind? As (C3 of CFL A1: meaning is perspectival) demonstrates, this is clearly the position of Cognitive-Functional Linguistics: The meaning of an utterance is identified with how the speaker construes what he/she wants to utter (cf. Geeraerts 2006b: 4). It follows that the hearer

"understands" the utterance when he/she grasps the result of the speaker's construal of what he/she wanted to utter.

The considerations about the question of how dependent or independent language and its structure are from the individual's mind or from "supra-individual" matters reveal a puzzle: Cognitive-Functional Linguistics has long been blind to the social and, as the absolute assumptions (taken as the least common denominator in Cognitive-Functional Linguistics) illustrate, there is actually no means by which the gap between the focus on cognition and the obvious relevance of supra-individual matters could be bridged. However, Cognitive linguists know about this desideratum. As Geeraerts & Cuyckens (2007b: 15) put it,

> "Cognitive Linguistics, by its very 'cognitive' nature, has a tendency to look at language from a psychological point of view, that is, language as (part of) the organization of knowledge in the individual mind. However, a number of researchers […] emphasize that the experientialist nature of Cognitive Linguistics does not only refer to material factors (taking a notion like 'embodiment' in a physical and psychological sense) but that the cultural environment and the socially interactive nature of language should be recognized as primary elements of a cognitive approach."

Eight years before Geeraerts and Cuyckens, Langacker had already emphasized the need to take "the dynamics of discourse and social interaction" (Langacker 2000: 376) into account.[33] I would suggest that the social factor has largely remained a desideratum because of the possible consequences for a cognitive semantics that would come about when cognitive semanticians realigned themselves toward a sociologically compatible view on meaning that goes beyond the individual mind. It shall not be concealed that there has been work in cognitive sociolinguistics more recently (cf. Kristiansen & Dirven 2008, Croft 2009, among others) but they seem to avoid touching on the question of meaning. The gap between the individual's cognition and the relevance of sociocultural factors and the central question of meaning that hovers above them might be a powder keg for the unity of Cognitive-Functional Linguistics and its semantic sub-part in particular (see also Bernárdez 2005 on this gap). The mentioned gap concerns nearly all of the basic assumptions of CFL and there is the danger that CFL and sociological considerations could remain incompatible. The desideratum would also remain then, and sociolinguistics would be left independent of Cognitive-Functional Linguistics. The way out of this situation would be the constitution of a well-defined research programme bringing together both sides which ought to be generally acceptable both for Cognitive linguists (and semanticians) and for those researchers working in the socially and culturally oriented fields.

This affects especially the Cognitive Commitment (CFL A3). Language and its structure would then reflect not only general cognitive principles but also principles originating in sociocultural interaction (I try to show this especially in sections 3.2.4 and 4.4). In the same vein, linguistic[o] structures should reflect what is known about cognition from the other cognitive sciences and what is known about (verbal) interaction from the social sciences as well.

[33] See also Sinha & Jensen de López 2002 who make an attempt to reconcile the biotic and the sociocultural origins of conceptual development, thereby building on a Vygotskyan framework (Vygotsky 1962). However, to anticipate what is yet to come, even this attempt remains a form of scientism, thus eliding questions of validity of scientific statements. Scientism pertains to the belief that any significant problem could be solved by natural scientific methods. In other words, every inquiry falls under the subject-matter of the natural sciences. However, scientific methods do not provide criteria by which one could distinguish true from false. See also section 2.4.

The assumptions in (B A3: intersubjectivity) and (B A4: action competence) are mainly a consequence of what has been said about the realignment of a cognitive semantics and its supplanting with sociocultural, or actional, considerations. Because of its concentration on what happens in the individual's mind, one would expect questions of sociocultural praxes and interaction to be rather rare in Cognitive-Functional Linguistics. And this actually seems to be the case. In all the textbooks and handbooks listed in the introduction to chapter 2 these matters are hardly ever mentioned. An exception is Langacker (1999). He identifies two primary functions of language, the "semiological" and the "interactive" functions, the latter including communication (Langacker 1999: 14). While he notes that both functions, symbolizing conceptualizations by means of sounds and gestures, and discourse with interlocutors, cannot be understood independently of each other, he remains in the realm of the individual's mind when he states that

> "[i]nteraction is critically dependent on the embodied minds that engage in it, and cannot be properly understood or described without a detailed characterization of the conceptions they entertain, including their conceptions of the interaction itself and of the interlocutor's conceptions." (Langacker 1999: 14f.)

In Langacker (2008a: 30), he justifies focussing on the individual's mind in methodological terms: Questions concerning the social aspect of meaning "cannot be fully answered unless the knowledge of individual speakers is taken into account."[34] In the same vein, Langacker (2008a: 7f.) states that "cognitive linguistics stands out by emphasizing the semiological function of language. It fully acknowledges the grounding of language in social interaction, but insists that even its interactive function is critically dependent on conceptualization." It seems to me that Langacker does not factor in here that there is no unmediated access to conceptualization other than via the results of interactions, i.e., via the ineluctable, already existing interactive praxis which even provides the criteria for what conceptualization can accomplish or not.[35] Section 2.4 and 3.1.1 will show how such methodological problems can possibly be avoided. The task then is to re-align assumptions (CFL A1) to (CFL A4), as is attempted by (B A1) to (B A4) in order to take into account matters of interaction, intersubjectivity, communication, and semiotics.

One word on the proceeding throughout this section: The basic assumptions of Cognitive-Functional Linguistics and the ones presented here have been outlined in a very brief fashion. Since I share some though not all of the former, I have refrained from giving a detailed description of the leading psychological, philosophical, grammatical, and semantic ideas

[34] Interestingly, Jackendoff's (1990, 1997, 2002, 2007) "conceptual semantics" takes a similar "intra-individual" position. Jackendoff (2002: 280f.) argues that any "contextualist" approach to meaning can in the end be reduced to the question of what "is present in people's f-minds when they grasp a meaning."

[35] These comments also concern Knott (2012). Knott's subject-matter is quite similar to my own (actually, he explores the relationship between "sensorimotor cognition and natural language syntax"), but he locates it in a hybrid of a Cognitive-Linguistic (conceptual part) and Chomskyan Linguistic framework (cognitive architecture, syntax). His work is remarkably comprehensive and deep, but crucially it lacks a discussion regarding philosophy of science in which the compatibility of the CFL and CL programmes needs to be addressed, because they seem to be incommensurable when it comes to the metaphysical assumptions mentioned in section 2.1.1. (as well as in 2.1.2 and 2.4). As a consequence, it neither addresses one of my central concerns, namely the metaphysics of thematic roles and the cultural, i.e., sociocultural grounding of most of our cognitive and linguistic^{o} activities.

underlying it. This will be caught up in the context of the development of the research programme.

2.2 A new research programme

2.2.1 The subject-matter of the programme

Bearing in mind the components of the empirical cycle and the model constituting a research programme, we now turn to filling in the blanks.

> Subject-matter of the present programme is one aspect of the competence of an individual to successfully interact verbally, namely his/her ability to encode and decode concepts of potential and actual states, processes, and activities by means of utterances containing verb-complement structures.

The structures in question are often called "argument structures" or "predicate-argument structures" (e.g., Grimshaw 1990, Bresnan 2001, Goldberg 1995) which is insofar problematic as the subject-matter comprises syntactic structures, while both labels mentioned clearly contain semantic notions. For reasons of methodical carefulness one should not intermingle formal and semantic notions (cf. Kasper 2011). On the other hand the term "verb-complement structure" seems to be occupied by the research programme of Chomskyan Linguistics (cf. Chomsky ^{2}2002 on "verbs" and "complements") and carries with it all the assumptions behind it. The term is, however, also used by linguists who are rather programmatically unbiased and of a descriptive provenience as opposed to the explanatory claims of CL. Therefore it will be adopted here, but explicitly in the latter sense (cf. Eisenberg 1999, Storrer 1992). For now, complements are defined as those elements in a sentence which stand in a syntactic valency relationship with the verb, including traditional "subjects", "direct" and "indirect objects" as well as many prepositional phrases.

More specifically, I will explore how interactants conceive of objects (in a broad sense) and states, processes, and activities in which objects are involved under certain communicative circumstances.[36] These notions are the central units in conceptual structure which in turn is part of semantics within the semantics-syntax relationship (the other being actional knowledge). The question is then how specific conceptual structures are encoded and decoded by means of syntactic structures. Keeping in mind that semantic structures as well as syntactic structures belong to our "knowledge" structure and should therefore likewise be conceptual in nature, the conceptual structures must *stricto sensu* be distinguished from syntactic-conceptual structures. The latter will simply be called syntactic structures but it should be kept in mind that they have some psychological relevance. The primary focus does not lie here on possible syntactic structures and "operations", i.e., on the question of how syntactic elements combine to constitute the grammatical and only the grammatical sequences that are part of a

[36] See sections 2.4 and 3.4 for definitions of the event structural notions employed here.

particular language which is the externalization of the competence of the members of a homogenous speech community (cf. Chomsky 1965).

Instead of this, the question is rather how far one gets when attempting to explain syntactic(-conceptual) structures, i.e., verb-complement structures, on the basis of the workings of conceptual structures, i.e., from conceptualizations involving concepts of objects, states, processes, activities, and fundamental instruments of conceptual organization on the one hand, and on the basis of matters of actional knowledge (especially attribution), all this embedded in contexts of action and interactive communication (as suggested, for instance, by Tomasello 2008: 333).

What are the semantic counterparts of relational elements, e.g., verbs and prepositions, and non-relational ones, e.g., nouns? How shall we conceive of their combination during conceptualization? What regularities are there in the way specific (complex) concepts are encoded linguistically[o]? What are the means and instruments by which they are encoded? How can we account for these regularities? What is the role of actional knowledge in linking? These are the issues which shall be discussed in the chapter on linking and the preparatory chapters on action, conceptual structures, and syntactic structure (see chapters 3.2, 3.3, 3.4, and 4). They clearly touch on many questions about the relationship between syntax and semantics, e.g., the question of the degree to which syntactic structures work autonomously. Such issues will also be discussed in the preparatory chapters (3.3).

2.2.2 The "individual" level in the model

We need a theory of the syntax-semantics relationship that is socioculturally and cognitively/perceptually grounded (cf. Tomasello 2008, esp. section 6.2.1 on foundational work in this direction). People actually use language, i.e., they know what to utter under which circumstances in order to interact successfully verbally. They obviously have a competence about how to link formal and semantic aspects of language. The linguist's task, then, is to formulate a theory of the syntax-semantics relationship that describes the competence of individuals to relate forms and contents in a situationally appropriate manner. This is captured in the first sub-part of the model constituting the proposed research programme.

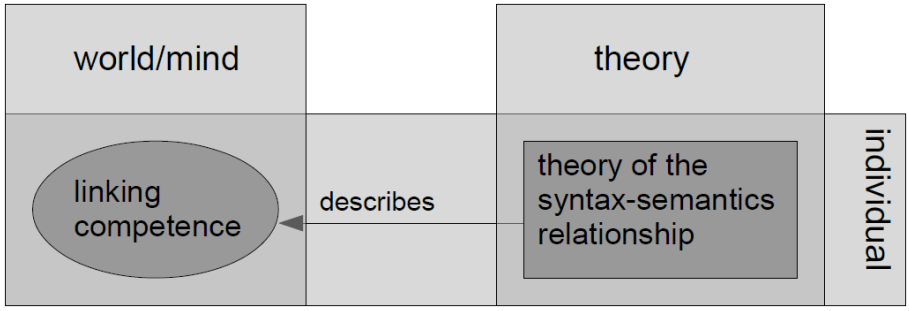

Figure 2.1: "Individual" level of the model

Figure 2.1 depicts one stage in the spiralling of the empirical cycle, namely the stage of the first theory. On the left side, the oval encloses the phenomenon to be described. This is what has been identified as the subject-matter of the programme further above in this section, here abbreviated as "linking competence". This linking competence is part of the "world/mind". As a cognitive competence it is primarily "part of the mind" (but see sec. 2.4 on mental termini), as manifested in actual communicative interactions it is part of the material world. How far world and mind coincide is not a question discussed here (see, for instance, Beckermann [3]2008, Hartmann 1998: esp. 257ff., for such discussions from completely different perspectives). It shall suffice here to say that there is something to be described and explained, be it two aspects of the same phenomenon. On the right side the rectangle encloses the linguist's "theory". This theory aims at describing the phenomenon just identified in the world/mind. Although the rectangle is included in the theory domain it shall be emphasized that any theory once formulated is also part of the world. Anything claimed valid by the theory with respect to its subject-matter applies to itself, then, insofar as the theory itself – as an assembly of linguistic[o] expressions – contains something that overlaps with its phenomenon range.

While "world/mind" and "theory" divide the parts of the model on the vertical there is also a domain on the horizontal which includes both the theoretical and the phenomenal units, namely the "individual" level. This level designates the scope of both the theory and the phenomenon component. It should be taken not too literally, however. The term "individual" stands in a twofold field of tension. On the one hand there is a biologically based distinction between "individual" and "species". This would be the distinction to be made within a research programme that could be termed (or which would term itself) "naturalistic". Such a programme considers human beings to be solely natural objects and thus objects of natural sciences. I would allege that most if not all of the theories mentioned above, as defendants of the third view of the syntax-semantics interface, could be subsumed under such a view, since many of them are working on components of the research programme of Chomskyan Linguistics. In the model proposed here, the individual level does in fact concern the individual in its biological sense, but not exclusively. It has been argued above that the human competence in question draws from two sources, biotic and sociocultural. Consequently, a theory that deals only with the biotic endowment of a human individual misses half of what is actually relevant. That is to say, there is on the other hand a sense of "individual" according to which it stands in opposition to "community".[37] In this pairing, "individual" loses most of its biological implications and enters another tension which has sociological (e.g. Abels [3]2007) and/or action-theoretic implications (e.g., Habermas 1981 on sociological and action-theoretic grounds, Hartmann 1996 and Janich 2001 on action-theoretic grounds; cf Miebach [2]2006 for an overview). In sum, the fact that the individual is doubly bound prescribes the theoretician to explore his/her subject-matter from two perspectives at once, couching it in a single theory (see sec. 2.4 on the difficulty of choosing the adequate descriptive means for such a task).

[37] This "opposition" should not be conceived of as a dichotomy of isolated domains. This would only obstruct one's view on the intricate mutual dependencies among individual and community (cf. Daniel [5]2006: 390ff.). The opposition should be open enough to allow for the individual to represent part of what constitutes the community. At the same time, the community is to some degree determined by the performance of each of its members.

With respect to ten Hacken's (2009) concept of scientific progress, a theory and its subject-matter alone do not constitute an empirical cycle. The theory is not the lowermost stage in the cycle's spiralling. In the beginning there must be observable facts and observations of an observer.

2.2.3 Observable facts, observations, and heuristics for collecting interesting data

As to observable facts, principally any verbal expression in interactive contexts is available which contains the structures in question or, more precisely, which can be analyzed as containing these structures. The observations (i.e., data) thus comprise abstract descriptions of a subset of the observable facts as well as variables of the interaction.

The concrete linguistic^{o} structures in question are of a quite simple nature. The situations on which their analysis shall be based are therefore construable as *possible* successful communicative acts. However, corpus-based analyses are in principle desirable (cf. Geeraerts & Cuyckens 2007b: 16ff.) in order to be (at least partially) independent of subjective intuitions. An example of a possible successful interaction would be the construed communication situation of the following type.

Face-to-face communication between A and B who both know Peter and Mary.

(2.12) A: *Peter hat Maria einen Brief geschickt*.
Peter.3NOM have.3AUX Mary.DAT a.ACC letter send.PTCP
'Peter sent Mary a letter.'

B: *Ich weiß*.
I.1NOM know.1
'I know.'

A: … (does not signal misunderstanding)

The example in (2.12) is so simple that this type of communicative exchange (e.g. when substituting the names) probably happens several times a day. The example provides data. One could describe the possible observations – depending on the identification of the main topic – as two verb-complement structures, whereat *hat geschickt* in one case and *weiß* in the other case are the verbs and *Peter*, *Maria*, and *einen Brief* as well as *Ich* are the respective complements. The reduced variables of the interaction, or "interactional variables" are given as superscript above the verbal expressions. In this case this is a "Face-to-face communication between A and B who both know Peter and Mary". These variables contain situational, contextual and individual factors (see sections 3.2.1.4 to 3.2.4). But what is interesting about these structures and variables and how might they serve a theory of the syntax-semantics interface? Or, to put it differently, what are the interesting data to be drawn from such observable facts?

The first question to ask is why the complements have the form they actually have. Why does *Peter* take nominative case morphologically, *Maria* dative case and *Brief* 'letter' accusative

case?[38] Why do other patterns of case assignment result in ungrammatical structures, e.g., when *Peter* and *Maria* take dative case and *Brief* takes accusative case, resulting in (2.13).

(2.13) *(*Dem*) *Peter hat* (*der*) *Maria den* *Brief geschickt*?[39]
The.3DAT Peter have.3AUX the.3DAT Maria the.3ACC letter send.PTCP

What governs case assignment in general? Second, why can *Brief* not change cases with *Maria*, yielding (2.14).

(2.14) #*Peter hat (die) Maria einem Brief geschickt*?[40]

Most speakers of German would concede that this utterance is grammatically well-formed but odd in some other respect. How can this oddity be described and explained?
Third, what is the difference between the "badness" of the former and the latter sentence? Seemingly, the latter sentence shows nothing different than another pattern of case assignment which led to ungrammaticality in the former case. Nevertheless, it can be described as well-formed.
Fourth, making a cloze out of A's utterance in (2.12) by deleting the participle *geschickt* 'sent' yields an interesting effect. One can predict which (kind of) verb can occur in the gap on the basis of the presence of a nominative, a dative and an accusative complement. The prediction may be vague but one could think of something like a verb which describes some schematic transfer or prevented transfer. This makes the insertion of numerous verbs possible which all share this semantic feature. Few or no other verbs could be inserted into this structure.[41] Where does this effect come from? Why do we not find it in the case of B's utterance? When deleting *weiß* 'know' (and abstracting the context) one cannot predict any similarly unique semantic feature as in the former case. One could insert as different verbs as *sterben* 'die', *träumen* 'dream', *verschwinden* 'disappear', or *transpirieren* 'transpire'.
People familiar with Chomskyan-style Generative Grammar can easily answer the first three questions. First, A's utterance in (2.12) has the form it has because of the grammatical competence of A. The alternative coding of the complements are ruled out as ungrammatical on the basis of an ideal speaker-hearer's grammaticality judgment (cf. Chomsky 1965: 3ff.). Second, *Brief* cannot change cases with *Maria* for reasons of language use only. The grammatical competence of a speaker-hearer would presumably judge this sentence well-formed (i.e., grammatical). The Generative grammarian would assess that it is only inappropriately "put to use" and thus a matter of performance, not grammatical competence (cf. Chomsky 1965: 10ff.). Third, grammaticality and pragmatic "deviation" mark the dividing line between the oddness of the sentences in question.

[38] Cf. Dürscheid 1999, Blake [2]2001, and Croft 2001 on diagnostics with respect to the case category.
[39] Ungrammatical utterances will by marked with an asterisk.
[40] Unacceptable utterances will be marked with an octothorpe. It should be kept in mind that in a usage-based approach non-well-formed (ungrammatical) utterances and inappropriate (unacceptable) utterances can sometimes not be sharply distinguished.
[41] It is difficult to assess the status of verbs like *beschmieren* 'bedaub', *zerreißen* 'tear apart' or *nennen* 'call' (in the sense of *call x an y*) with respect to the concept of "transfer". Questions like these will be discussed throughout this book.

Unfortunately, one must rely on judgments of speakers in collecting the relevant data. These judgments shall reflect the underlying competence(s) of the speaker, even when one works with a corpus: The linguist could in principle pick communicative situations containing verb-complement structures for analysis but one cannot reliably reconstruct whether an interaction has failed or succeeded, or, if it has clearly failed, what the relevant factors have been. The competence to interact successfully verbally by means of verb-complement structures is the subject-matter of the programme. Thus, it comprises aspects of both grammatical competence and "pragmatic competence" (Chomsky 1980: 224), since communication might fail because of both ungrammaticality and the pragmatic "inappropriateness" of one's utterances (among other, channel- or code-related matters). That means the data are made up of those (verb-complement) structures which can be judged grammatical and "appropriate" in relation to the communicative situation in question. These concepts cannot, however, simply be borrowed from the Generative Grammar framework without further ado. They must be adjusted to and made compatible with the present research programme. Both Chomskyan concepts rest on the theses of the autonomy of syntax and on the innateness of grammatical competence which are challenged by Cognitive-Functional Linguistics (without having led to any agreement, however). One has to answer the question, then, where agreement among speakers about the grammaticality of sentences comes from, if not from an innate and/or encapsulated syntactic module. Part of the answer lies in the assumptions about the organization of our conceptual system, including the relationship between syntactic structures and conceptual structures (see sections 3.3 and 3.4). At this point it shall suffice to point out that grammatical knowledge is not incompatible with the assumption of a non-autonomous syntactic structure, and that such agreement among users of a language is due to their similar histories of confrontations with usage-events which allow them to extract schematic syntactic patterns from actual usage-events (cf. Tomasello 2003, Clark 2003).

In CFL, as has been mentioned, there is no agreement on the status of the syntactic component in a grammar and it is not surprising that one hardly finds a characterization of well-formedness or grammaticality in the respective literature. (This might in part be due to the fact that this is a theory-dependent notion. There is no definition of grammaticality without a corresponding theory of grammar; cf. Ágel 2000: 175). A simple characterization should contain the following assumptions: Grammatical knowledge, i.e., knowledge about which actual syntactic structures are possible (grammatical) or impossible (ungrammatical) is gained via usage-events, thus shaping our syntactic-conceptual knowledge. This knowledge is furthermore constituted by the abstraction of syntactic structures from actual utterances, the former becoming entrenched with every further encounter of the same structure. The evaluation of new structures rests upon the success or failure of the matching of entrenched structures or combinations of them (cf. Kemmer & Barlow 2000, Langacker 2000, ch. 4, ^{2}2002: ch. 10) throughout identification.[42] As Kemmer and Barlow (2000: xiii) put it,

> "[…] the speaker's linguistic system is fundamentally grounded in 'usage events': instances of speaker's producing and understanding language. 'Grounded in' means that linguistic representations are tightly linked to usage events […]."

[42] By entrenchment I mean the routinization and automatization of certain cognitive movement schemas, accompanied by the potentiation of the corresponding neuronal pathways. See section 2.4 and chapter 3 on the learning-theoretic, neuroscientific, and action-theoretic terms.

Grammatical knowledge is insofar "fundamentally grounded", as usage-events are "experience from which the system itself is initially abstracted" (Kemmer & Barlow 2000: ix).
A usage-based account of grammatical knowledge might serve then to propose an alternative characterization of well-formedness, one which is not based on the central assumptions of Chomskyan Linguistics. Such an alternative must again be complemented by sociocultural aspects as highlighted above.

Then, competence to make grammaticality judgments is the ability of a member of a speech-community to decide whether the syntactic structure underlying a particular utterance is well-formed or ill-formed on the basis of (frequent) prior experiences with utterances which successively have led to entrenched, schematized syntactic-conceptual structures against which the syntactic structures of actual utterances can be evaluated by means of identification as being instances or non-instances of the former.

Since speech is action and action constitutes praxes, speech-communities are constituted by sociocultural praxes. This in turn means that usage-events, i.e., actual utterances in communicative situations, should in part be shaped by sociocultural, i.e., action-theoretic factors. Thus, agreements among speakers concerning grammaticality can only in part be explained by recourse to their conceptual systems because our access to them is mediated by usage, i.e., actual verbal interactions. If verbal action is only one form of action among others, and action is what we are made responsible for, the manner in which we act is regulated by norms of our community. In other words, although what becomes entrenched in our conceptual systems are the frequent inputs of certain syntactic structures, these structures are not "raw" but already "filtered" (by means of feedback, examples and counter-examples) through norms of action. This leads to grammaticality as a social convention (cf. also Tomasello's (2008, section 6.3.3) well justified normative characterization of grammaticality).
The central weakness of usage-based models of grammatical competence (and with it the competence to judge grammaticality) is that they do not specify the endpoint or goal of the development which they are claiming takes place, and most importantly, who determines what the criteria are for it to have arrived (cf. Berger & Luckmann [20]2004: 53). There are obviously three possibilities. First, this endpoint (the "possession" of a competence for which judgment performance is an indicator) is natural, evolutionarily driven, or it is – secondly – cultural, determined by people, or, thirdly, both. The acquisition of interactive communicative competence (as present in the usage and understanding of utterances containing verb-complement structures) to become a member of an existing sociocultural praxis is a development with an endpoint that is specified "by the praxis itself". There is no observer possible to decide whether someone has or has not the linguistic[o] competence in question, unless he/she is at the same time participating in the praxis the competence is part of. So, the community members decide whether one has the competences in question. It is probably not by chance that in naturalistic theories the development of grammatical competence ends with something like a mature speaker's ability to produce and understand situationally adequate

utterances. I doubt that this is by chance, since these endpoints, as I would suggest, mark the stage in which one fulfils the requirements for being a "full" member of speech community as part of sociocultural praxis. From this perspective, the development of grammatical knowledge and any other sort of "knowledge" cannot plausibly be described as being a natural process (alone), since nature does not provide the criteria necessary to make such a decision. The stages that have to be gone through as well as its endpoint strongly appear to be culturally determined (cf. Sinha & Jensen de López 2002, building on Vygotsky 1962, veering to such view). In the present account, the prior, implicit, and unjustified determination of the goal of development is avoided. Instead of this, the subject-matter of the programme marks this goal – becoming a competent member of a speech community. Naturally, nothing develops without there being something to develop, i.e., the individual's biotic endowment. And it should also be clear that the development of a competence is definitely restricted to the possibilities provided by our bodies (cf. Tomasello 2008 on a naturally based "cognitive infrastructure"; cf. Janich 2000: 78ff. on the problem of the goals of development, especially in evolutionary psychology and radical constructivism).

Anyway, a comprehensive theory of grammaticality is not the purpose of this programme. In sum, the capacity to have grammatical intuitions is (and will be shown to be) compatible with a non-modular conception of syntax. Obviously, we come with this capacity. Most examples in this work are of such a simple nature that they are "easy to judge".

Besides grammaticality, "pragmatic competence" plays a major role with respect to our subject-matter. Consider (2.14) above. The fact that someone cannot send a letter Mary (where a letter is the recipient of the moving Mary) is mostly explained not by grammatical ill-formedness but by performance factors. In fact, communicative appropriateness is more difficult to characterize than grammaticality, since within CL, the scope of performance is not as precisely defined as that of competence. Another difficulty lies in the fact that one cannot simply adopt the performance notion from CL, since its distinction between grammatical competence and pragmatic competence relies on the autonomy[43] of the former, thus allowing for a strict demarcation between both. Furthermore, the definition of pragmatic competence presupposes the adoption of grammatical competence and the primacy of syntax over pragmatics, at least. According to Gumperz (1972: 205),

> "linguistic competence [i.e., grammatical competence – SK] covers the speaker's ability to produce grammatically correct sentences, communicative competence describes his ability to select from the totality of grammatically correct expressions available to him, forms which appropriately reflect the social norms governing behavior in specific encounters."

Questioning the autonomy and primacy of syntax/grammar then means giving up the possibility of this sharp distinction. According to Chomsky, (1980: 224) grammatical competence is all about form and its relation to meaning, while pragmatic competence concerns "knowledge of conditions and manner of appropriate use, in conformity with various purposes." This is fully compatible with the dependency relation between grammatical and pragmatic competence put forward by Gumperz.

[43] In this context, autonomy of grammatical competence can be characterized such that knowledge about the formal properties of languages cannot be derived from, or explained by recourse to, some other type of knowledge.

The gap between grammatical competence and pragmatic competence has not yet been closed by Cognitive Sociolinguistics within CFL. In fact, it is hardly a topic at all (cf. Kristiansen & Dirven 2008). Again, as with the syntax-semantics interface, not conceding grammar an autonomous status seems to complicate theoretical matters. However, this is the price on has to pay for the "recontextualization" (Geeraerts & Cuyckens 2007b: 11) of linguistic[o] competence as opposed to its "decontextualization" (ibid.: 10) by Chomskyan Linguistics. A solution might be possible and usage-based models together with the notion of "communicative competence" provide the means. What will follows now might be worn out, but it is very important at this point. In a critical assessment of the Chomskyan dichotomy between competence and performance from a sociolinguistic perspective, Hymes (1972) severely criticizes Chomsky's "decontextualizing" program in which he deprives "the keeper" of interactive communicative competence, i.e., the individual capable of speaking, of its social competences (cf. Hymes 1972: 272). Instead, he claims "that the competency of users of language entails abilities and judgments relative to, and interdependent with, sociocultural features […]." (Hymes 1972: 277). The linguist has not only to account for the child's acquisition of grammatical competence but also of the competence to judge utterances appropriate or inappropriate. "A model of language must design it with a face toward communicative conduct and social life." (Hymes 1972: 278). These considerations led Hymes (1972: 279) to the proposal of a "communicative competence", among which grammatical competence is only one besides others, including knowledge of appropriateness etc. (see also Rickheit, Strohner & Vorwerg. 2008, Rickheit & Strohner 2008).

> "Within the developmental matrix in which knowledge of the sentences of a language is acquired, children also acquire knowledge of a set of ways in which sentences are used. From a finite experience of speech acts and their interdependence with sociocultural features, they develop a general theory of the speaking appropriate in their community, which they employ, like other forms of tacit cultural knowledge (competence) in conducting and interpreting social life […]." (Hymes 1972: 279)

Among the questions that arise with respect to such a communicative competence are those of grammatical competence and what Chomsky terms pragmatic competence. The latter can now be characterized in accordance with Hymes and tuned to the subject-matter of the present work.

Then, pragmatic competence concerns the ability of a member of a speech-community to decide whether a certain utterance's semantic content[44] is appropriate or inappropriate in relation to a given communicative situation and to the action theory[45] the members of a speech-community have internalized on the basis of (frequent) prior experiences with actions and utterances which successively have led to entrenched actional knowledge, against which actual utterances can be evaluated (by means of identification) as being instances or non-instances of appropriate action.

[44] Anticipating what is yet to come, this should be understood here as the conceptual and attributional contents that the interlocutor associates with the syntactic structure in question. On conceptual and attributional contents see section 3.2.
[45] On actional knowledge cf. section 3.2.2 and 3.2.3.

Such a characterization of pragmatic competence is fully compatible with a usage-based account of language because it proposes considering the development of grammatical knowledge and pragmatic knowledge to be co-extensive. They are interdependent as well, since in our everyday praxis there is no grammatical competence possible, or, at least, observable without pragmatic competence and the other way around, maybe except for very specific pathological cases. Successfully interacting by means of verbal communication is identical with being grammatically and pragmatically competent.
Consider an example which could illustrate this interdependency. It repeats (1.9) from section 1.3 and shows why it is problematic to attribute the syntax-semantics relationship and actional (pragmatic) considerations to different cognitive modules.

(2.15) The three-year-old twins Jessica and Nicole are at dinner with their parents Sarah and Marc. Nicole reaches for the milk carton. She grips it only with her fingertips, causing it to fall down. It falls off the table and runs all over the floor. Jessica and her mother have kept track of what happened.

(a) Jessica: *Nicole hat die Milch runtergeworfen*.
Nicole.3NOM have.3AUX the.ACC milk down-throw.PTCP
'Nicole knocked over the milk.'

Sarah: (hesitating, looking at the surprised causer)

(b) *Nein, sie ist ihr runtergefallen*.
No it.3NOM be.3AUX her.DAT down-fall.PTCP
'No, (it happened to her that) it fell down.'

Jessica: … (not signalling misunderstanding)

Speakers of German know these situations well and the linguistic^{o} structures which accompany them. Speaking pre-theoretically, they are about whether one should be blamed for what one has caused or not. As will be argued in the section on action theory (sec. 3.2.1.4 to 3.2.4), the mother's judgment of the girl's utterance as inappropriate in (2.15) is due to a learned and internalized actional "knowledge". Such judgments are constrained by many factors which are in part culture-specific and which must be learned by children growing up in this culture. The example shows that sociocultural factors, i.e., factors of pragmatic competence, directly enter grammatical structure, as indicated by the different patterns of case assignment and coding of the verb. That means "knowledge" about how to construct grammatical sentences and "knowledge" about how to put them to use cannot be properly separated (cf. Hymes 1972: 279, Wardhaugh ^{5}2006: 250f.). If this is true, then linguistic^{o} structure and the socio-culturally constrained structure of interaction are not isolated domains, but clearly bear upon each other (see also Ariel 2008 on this topic). (The fourth question presented above concerning some schematic transfer meaning in (2.12) shall not be pursued

here. It is about the possibility of constructions (cf. Goldberg 1995), and this will be discussed in section 4 in some detail).
In sum, actual or (properly construed) verbal expressions within interactions constitute observable facts. The actual observations, i.e., the data, are constituted by a subset of the possible observations, i.e., by interactional variables and parts of speech analyzed by the linguist as containing grammatical and appropriate verb-complement structures. Grammaticality and appropriateness can also be judged via elicited responses.
Obviously, there is one step missing in the identification of interesting data as a basis of theoretical modelling. How do we "extract" data as a basis of explanation from the observable facts? Consider the interactional variables first by means of example (2.15) above. Interactional variables are provided by features, properties, and dispositions of the participating individuals, the framing situation[46] in which the interaction takes place, and by the wider context in which the interaction takes place. For instance, the interactional variables overtly present in (2.15) above are constituted by several observational facts, among them the information that there are three-year-old twins, what their names are, that the framing situation is "dinner" and so on. More important information (where the degree of importance is clarified in the context of sections 3.2.1.4 to 3.2.4) is supplied by the fact that one girl seems to be immediately willing to make her sister responsible for what she has caused, namely the milk's falling down, while presumably nothing has indicated intentionality in this event as it is observable. Here, the interactional variable can (to anticipate what is yet to come) be identified with some factors ranging between the individuals involved and the context of the event. It is specifically the relationship between the mother and the causer on the one hand and the sister and the causer on the other hand. What determines the assessment of the state, process, or activity by the participants is not only what they see, but also their personal (individual) dispositions and the state-, process-, and activity-independent relationship to the other participants (context) (cf. Moskowitz 2005: chapters 6, 7, 8 on influences on the assessment of situations). In short, then, it depends on how they identify or conceptualize the states, processes, and activities.
How do we "extract" verb-complement structures from utterances in actual interactions? It has been demonstrated above (section 1.1) that the form-content mapping in language is not straightforward. This is the reason that the formal properties of sentences can or should be described without recourse to their contents. On the other hand, the realm of meaning can or should also be described in separation from formal matters. This is, however, not a statement as to the "self-containedness" of each structure in an ontological sense, but it is justified exclusively methodically. This procedure of separating the levels serves the single purpose of describing their respective workings. After that the nature the form-content relationship can be characterized and explained. This makes it possible to find out whether, to what degree and which semantic and pragmatic factors motivate syntactic structures. The widely known method for analysing utterances into formally characterized smaller units is the distributional method (cf. Saussure 1916, Bloomfield 1926, Trubetzkoy 1939, Harris 1946, Croft 2001). The distributional method yields formal constituents of different size, including those from phonemes to sentences. I will not catch up here on everything already accomplished in the

[46] The situation is constituted by the participating individuals and their environments for the time duration of the interaction. For the notion of environment see section 2.4.

past but will presuppose that the application of the distributional method to the utterances in question demonstrates that determiners, nouns, verbs, adjectives, adverbs, and prepositions show different distributional patterns. Two things are important with respect to the syntactic structures in question (like those underlying (2.12) and (2.15)). First, one type of morpheme is of great importance, namely that indicating case. The function of case will be discussed in section 4.1.6. However, case morphology has been demonstrated in the examples above to be of great importance with respect to grammaticality and appropriateness. Second, example (2.12) above constitutes an utterance, i.e., some part of the world, or of "parole", to borrow Saussure's (1916) terminology. As phones, morphs and other constituents of an utterance once segmented have corresponding units in "langue", namely phonemes, morphemes, etc., so must the utterance itself also have some corresponding formal unit. As Croft (2001: 11) points out, "syntactic categories are defined by the occurrence or nonoccurrence of their members in different types of utterances. Utterance types […] are defined in structural terms [i.e., in accordance with the distributional method – SK]. We will call utterance types constructions." Since we are talking about formal aspects of language here, I will also call the unit of "langue" corresponding to the formal aspect of an utterance a "syntactic construction" or simply "construction". Consequently, (2.12) consists of the morphological langue units {Peter},{ha-}[47],{-t},{Maria},{ein-},{-en},{Brief},{ge-},{-schick-}, and {-t}[48] and has an underlying syntactic construction of the type NP_{nom}-V-NP_{dat}-NP_{acc} (ignoring tense here). (The question whether constructions have some semantic import is the topic of section 3.3 and part III). The tendency or need to overtly case-mark proper nouns often interplays with the degree to which word-order is free (but see section 4.1.6.1). Presumably, in languages exhibiting global subject-object ambiguities in structures like (2.12) *Peter hat Maria einen Brief geschickt* determiners are used to make the identification of "who does what to whom" possible. As Rabanus (2008: 260) puts it, "speakers of German use morphological markers because they facilitate or even make possible the identification of the syntactic structure and with it the semantic-pragmatic interpretation of the utterance" (my translation). Consequently, word order is another central formal mechanism constituting syntactic structure. For now, this topic will not be pursued further here (but see sections 4.1 and 4.2).[49]

[47] It should be noted that this is a simplification and that matters with suppletives are more intricate than indicated here.

[48] Where is case in {Peter} and {Maria}, given that it is such an important notion? In Generative Grammar they would be assigned structural case. I will assume here that there are indeed zero-allomorphs ({-Ø}) indicating nominative and dative for {Peter} and {Maria}. Are there reasons to assume something like this? In most spoken varieties of German, proper names are actually case-marked by determiners, as I have done in (2.13) for convenience of understanding. Besides that, proper names were case-marked by bound grammatical morphemes in older forms of German. This pattern can also be found today in varieties of Switzerland (cf. Bucheli-Berger 2006, Schmidt ^{9}2004: 224).

[49] Actually, what is up to discussion here is a gap between "langue" and "parole". In the example, there is nothing in parole corresponding to the case category in the language system. However, the strict Saussurian dichotomy between "langue" and "parole" is rejected here because the gap can presumably be bridged by a usage-based account to language. This would mean that frequent prior experiences with similar syntactic constructions in which morphological cases are overtly realized have led to the entrenchment of the case concept and that this concept could be activated also in cases of perceiving these construction without overt case-marking. A connectionist usage-based account of German gender-marking has produced promising results (cf. MacWhinney 2000).

2.2.4 Implementing the data level

In section 2.2.1 the relation between the subject-matter of the programme (abbreviated: linking competence) and the theory of the syntax-semantics interface has been outlined. They are both related to the individual's grammatical and pragmatic competences. The theory and its subject-matter must, however, be based on data and observable facts, respectively. With the considerations of the previous section in mind the data level can now be implemented in the model by positioning it under the individual level, in accordance with the metaphorical spiralling of the empirical cycle from the bottom upwards. The revised model of the programme is given in Figure 2.2.

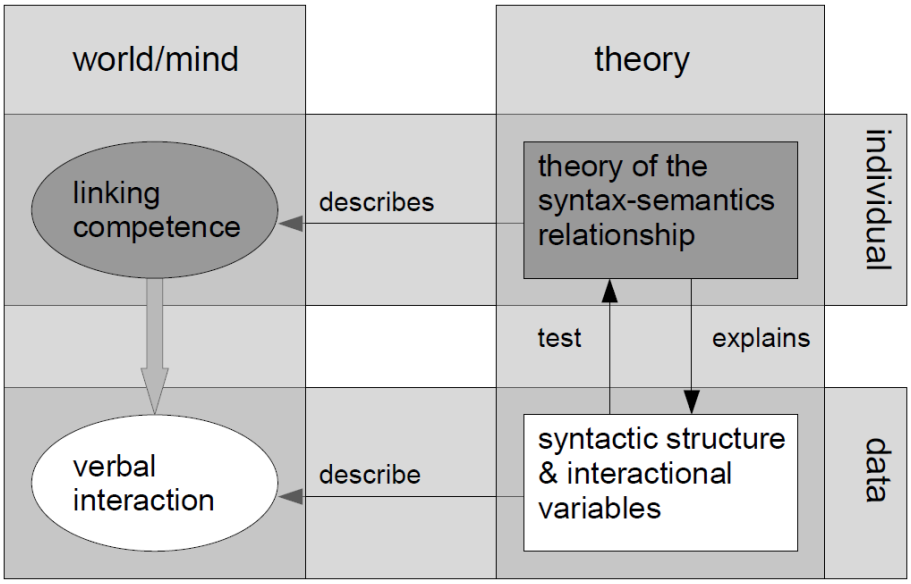

Figure 2.2: "Data" and "individual" levels of the model (revised)

On the left hand, the oval containing "verbal interaction" designates the interactants' communicative performance as part of the real world. Verbal interaction is here the abbreviation of what has been identified as observable facts in the previous section, i.e., actual or (properly construed) verbal expressions within interactions. Naturally, they contain instances of grammatical and/or appropriate as well as ungrammatical and/or inappropriate utterances. The girl's utterance in (2.15) is judged inappropriate by its mother within the communicative exchange. On the right hand, the rectangle containing "syntactic structure and interactional variables" designates neither raw observable facts nor an entire theory but rather "edited" data or some form of "transcription" of a subset of the observable facts in accordance with assumptions about how to collect interesting data. These assumptions comprise what has to be added to the mere components of the empirical cycle in order to set up a research programme. Such assumptions (termed "heuristics for the collection of interesting data" and criteria for selecting relevant data" in section 2.1.1) come from outside the empirical cycle itself and are imposed by the linguist exploring certain phenomena to certain ends. In other words, the theory part of the data level describes the world part of the data level in a specific way. The descriptions providing "syntactic structures" are supplied by the distributional method. The descriptive means providing interactional variables are more difficult to gain and to restrict. The problem is that a description of interactional variables is an interpretation of

the interaction itself, and this is ultimately the subject-object problem which we have been facing for centuries. It is virtually impossible to describe a situation neutrally without imposing causal relations on the situation by describing it. A possible explanation of the causal factors in a situation is then obscured by the description's being permeated by subjective judgments from the outset. Even perceiving (and imagining) a situation similar to the one described in (2.15) above includes setting up causal relations between components of what is perceived (or imagined). Even though this means relocating the problem, it seems feasible to use such descriptions. The text in (2.15) obviously attempts not to impose causal relations on sub-events or -situations, on the relationship between happenings and their verbal annotations. It does not address how the participants perceive and assess the situation, except for their linguistic^{o} utterances. That means much is left open for inferences of the reader (or observer, given the event is visually perceived). In addition, construals or descriptions of such contextual information accompanying utterances shall be compatible with results from sociology and socio-cognitive psychology about which factors govern the assessment of situations (see sections 3.2.1.4 to 3.2.4). This should account for the simultaneous overspecification (what is imposed on the situation) and underspecification (information missing in the description) of the description.

How is the data level related to the individual level? On the left side, there is an arrow connecting "linking competence" and "verbal interaction". It indicates that in every actual verbal interaction containing the structures in question the linking competence is realized, actualized, instantiated, or enacted. On the other hand, the linking competence is existentially dependent on actualized verbal interactions, since usage and experience in actual communicative exchanges are considered to underlie its development. But while the latter is described on the data level, linking competence is described on the individual level. On the right-hand side in the rectangles, there are extracted data on the data level and a theory of the syntax-semantics interface. They are interrelated in the sense that the theory must explain the data while the data test the predictions and explanations of the theory in that new data must be tested against those predictions and explanations of the theory made on the basis of previous data. Now, the empirical cycle can be recognized in the model. Its spiralling up is constituted by the twofold relationship between the data testing the theory and the theory explaining the data. The theory must be modified if new data provoke theory_1, formulated on the basis of data set A, to be adjusted to a new data set B, resulting in an improved theory_2 that also captures the data from B (cf. section 2.1.1). The different shading of the elements of the two levels indicates that it is the individual level that constitutes the narrow subject-matter of the present programme.

In section 2.1.1 six aspects have been listed which must complement the empirical cycle. Two of them have already been incorporated: what relevant data are (2) and how they are collected (3). Some absolute assumptions (1) have also been presented. At this point two further questions arise: What shall count as useful generalizations over the collected data (4) and which explanations for these generalizations are plausible (5)?

As for (4), in order to answer the question of which generalizations about the data are useful/sensible, one has to refer to the four components of the model identified so far and to empirical laws which are part of the empirical cycle but which do not directly show up in the model, although part of it can be thought of as being implicit in the "test/explains"-connection

between the two theoretical components. Obviously, empirical laws are the form in which generalizations are stated (similar to the astronomer who states something like "always at time *t* planet *x* is at point *p*"). It has been mentioned that empirical laws mediate between observations (here: syntactic structure and interactional variables) and theories (that about the syntax-semantics interface) and that they are "closer" to observations than theories are. Given a finite set of data similar to those in (2.15), what sensible generalizations can be made in consideration of the fact that they are logically infinite? Bearing in mind the notions of grammatical competence and pragmatic competence developed in the previous section as well as what has been identified as relevant data, the only useful generalizations to be made would have the following form: "An utterance *u* of the form *f* is possible, iff situation variables v_1, v_2, v_n are given." Applied to the example in (2.15) (as a placeholder for any similar example) this would roughly yield something like the following: "The utterance *Nicole hat die Milch runtergeworfen* with the underlying form [NP_{nom}-AUX-NP_{acc}-V_{ptcp}] is possible, iff the speaker has certain (cognitive) dispositions, the causer has certain (cognitive) dispositions, certain situational factors are given, and certain contextual factors are given." Whether an utterance is "possible" or not depends on the judgments of grammatically and pragmatically competent members of the speech-community. Such judgments can, for instance, be elicited via standardized questionnaires.[50] As a consequence, any generalization that accords to the linking competence is useful and serves as a basis for explanation. This leads to the other question, namely which explanations for the generalizations are plausible (5). At first glance, this question seems trivial. By looking at the model in Figure 2.2 it becomes obvious that it is the theory of the syntax-semantics interface which delivers the explanations for generalizations and the explanation is plausible when it describes the linking competence properly. The so-called indeterminacy problem lies in the fact that one can construe an infinite number of theories from a finite set of generalizations, similar to the fact that one can draw an infinite number of generalizations from a finite set of data unless there are criteria for choosing sensible generalizations. As a result, one needs a criterion to construe the "correct" theory from the available generalizations. The question about plausible explanations is thus intimately related to the question of how to evaluate concurring theories (6). Among the notions developed so far – those present in the model, those which are part of the empirical cycle, the heuristics and additional assumptions for resolving the cycle's problems – there is nothing that could provide this criterion. What we know is the following: The "best" theory should account for the fact that (i) the linking competence can be acquired, (ii) it is instantiated/actualized/used/enacted in every interactive communication, (iii) it is based on cognitive factors, (iv) it is based on sociocultural factors, (v) it is grounded in perception (vi) and interaction. In other words, the model in its present form cannot be complete yet.

2.2.5 Excursus: converging evidence

Presumably from the 1950s on, linguistics has more and more been cross-linked to neighbouring scientific disciplines. Although Bloomfieldian and post-Bloomfieldian linguistics were indebted to behavioristic psychology, the coming about of a (first) "cognitive

[50] This is actually done within a project with the title "Syntax Hessischer Dialekte (SyHD)" funded by the Deutsche Forschungsgemeinschaft (DFG). See section 3.2.4 and <www.syhd.info>.

turn" in the 1950s has led to new fields in linguistic research (cf. ten Hacken, 2009 on the terms "Bloomfieldian" and "post-Bloomfieldian; cf. Lakoff & Johnson 1999 on first-generation cognitive science). Especially Chomsky's so-called mentalism caused theoretical linguistics to reorient itself, since Chomsky (1968) declared linguistics to be a part of cognitive psychology, dealing with grammatical competence alone. The simultaneous development of digital computers gave rise the idea of a computational theory of mind as the leading paradigm in psychology and thus in theoretical linguistics (cf. Pinker 1994). However, as time went by, Chomsky's naturalistic programme more and more focussed on the biological (i.e., genetic) aspects of this competence. Nevertheless, one result of the "Chomskyan revolution" was the coming about of psycholinguistics as a sub-discipline of linguistics, but mainly for those interested in the production and comprehension performance of speakers (cf. Bresnan 1982). Another line of development that one could term "anthropological" complemented the cognitive turn in linguistics and explored language from an anthropological, ethnological perspective (cf. Basso 1970). This development is closely related to sociolinguistics as established by Labov (1972). Yet another line comes from philosophy and a "pragmatic turn". The name associated with this influence on linguistics is Austin (1972). Also throughout the 1970s, some linguists claimed a broader applicability of psychological considerations to linguistic questions than the Chomskyan framework allowed. This focussing on psychological questions beyond those of a computational theory of mind were motivated by important findings of Eleanor Rosch (Rosch 1999, Rosch & Mervis 1975) on the one hand and Brent Berlin and Paul Kay (1969) on the other hand with respect to human categorization. To be brief, throughout the second half of the 20th century, linguistics has been "hyphenated", making the interdisciplinary boundaries of linguistics fuzzier. This process has given birth to psycholinguistics, neurolinguistics, biolinguistics, evolutionary linguistics, clinical linguistics, sociolinguistics, anthropological linguistics, cultural linguistics, computational linguistics, and many more. Linguistic theorization has become more complicated, since it can not ignore the results of any relevant sub-discipline of hyphenated linguistics.

Respecting this development, Cognitive-Functional Linguistics has methodologically committed itself to what its members call "converging evidence" (Lakoff & Johnson 1999: 79/80, Langacker 1999: 26, Evans & Green 2006: 17. See also Sinha 2007: 1269, Harder 2007: 1247ff.). Langacker (ibid.) states that

> "[p]erhaps the most fundamental methodological principle I follow is to look for converging evidence from multiple sources. This is especially important considering the diversity of the cognitive-functional enterprise. An essential source of guidance and empirical support for work in any one area is its broad compatibility, and hopefully its convergence in specific details, with the findings of others."

What qualifies as findings of others then? With respect to the Cognitive Commitment (Evans & Green 2006: 40ff.) language should reflect what is known from other cognitive sciences, i.e. philosophy, psychology, artificial intelligence, and neuroscience. This statement has already been criticized above (section 2.1.2). In order to make the idea of converging evidence compatible with the present research programme, it has to be reformulated in accordance with the basic assumptions put forward here and with the mode of operation of the model. Then, converging evidence is provided by those findings of other scientific disciplines

or sub-disciplines (a) which can contribute significant input to a theory of the syntax-semantics interface, (b) which converge with generalizations suggested by the data in question, and (c) by those findings of other disciplines the fundamental assumptions of which are not incompatible with those of the research programme pursued here. The fundamental assumptions mentioned in (c) are the basic assumptions underlying the research programme.
Calling back to mind the four postulates from the introduction to chapter 2 (B A1) to (B A4) concerning the question of what the relevant parts of the programme are, and the claim that the linking competence is "doubly grounded" in – to put it roughly – perception and action, we can characterize those disciplines that will hopefully contribute to a explanatory theory (excluded are linguistic sub-disciplines): the branches of cognitive psychology and neurosciences dealing with perception and conceptualization, the branch of social psychology dealing with social cognition, the branches of sociology and social psychology dealing with intersubjectivity and attribution, and the branches of philosophy dealing with action. Due the double-grounding of the linking competence, this list also contains non-cognitive scientific disciplines, in contrast to what the Cognitive Commitment suggests.

2.2.6 Multidisciplinarity

The excursus on converging evidence has been inserted here because its wider implications shall contribute to the solution of the indeterminacy problem raised in section 2.2.2. This problem becomes even more serious when looking at different communities. The individual level in the model is conceived of as embracing two "oppositions", that between individual and community on the one hand and that between individual and species on the other hand. However, the individual level applies only to an individual in a specific speech-community. It should be clear, however, that any individual that stands in a relationship to a community acquires what has been termed "linking competence" independently of the language spoken in its respective speech-community (except for pathological cases). As a consequence, there are as many "correct" theories of this competence as there are speech-communities. So, one must find criteria to choose every "correct" theory from the possible theories in a way which allows for a formulation about what languages have in common.
A good theory aiming at an adequate description and/or explanation of its subject-matter must be plausible in the sense that is in accordance with the double grounding of language (cf. Tomasello 2008, Everett 2013). Since languages must be learned by children, and children must – based on usage – rely on their general cognitive abilities as well as on their interactive environment, a theory of the linking competence must be plausible with respect to all the above-mentioned disciplines.

> In other words, the best theory of the linking competence is one in accordance with the findings of the scientific disciplines identified as being related to its subject-matter.

This claim might seem trivial, but it is not. Consider the solution of the indeterminacy problem of another research programme, that of CL (cf. ten Hacken 2009: 73ff.; see also section 2.3). First, grammatical competence has been singled out as its subject-matter. Due to some absolute assumptions underlying the programme, the mode of operation of the part of

the mind corresponding to this competence does not resemble any other cognitive function, i.e., it is autonomous and self-contained. The indeterminacy problem – what is the correct theory of this competence – can then only be answered by reference to something that is compatible with an autonomous competence. Indeed, Chomsky uses the "learnability" of language as criterion, i.e., the theory must be open enough to allow any child to acquire its proper I-language and at the same time it must be restrictive enough to allow for the acquisition of the possible and only the possible I-languages. This tension is set up by means of the language faculty of which the grammatical competence of the individual is only an instantiation. The theory describing the language faculty is Universal Grammar. The indeterminacy problem is thus considered to be resolved by the tension captured "between" UG and the theory of grammatical competence. The critical notions in how the balance between openness and restrictiveness is created are those of the poverty of the stimulus and the innate (= present at birth) language acquisition device (LAD). *Stricto sensu*, the innate LAD represents the criteria of the correct grammar. From what has been said so far it follows that neither this sort of nativism nor a cognitively encapsulated grammatical competence employed in CL are available in the present programme.[51] What can be learned, however, is that indeterminacy must be resolved in part by reference to learnability. The species-specific, genetically based language faculty with which the innate grammatical competence of the individual "interplays" can be paralleled to the situation here: There is the competence in question which is doubly grounded. The simultaneous openness and restrictiveness of this competence can only be a result of its being related to aspects of general cognition available to the child and the way interactions are carried out within human communities as a frame of reference in which children develop.

2.2.7 Species, community, and sciences

In order to be able to deal with the indeterminacy problem we have to add one more level to the model. Its final version is given as Figure 2.3.

[51] Even the assumption of a partially autonomous grammar does not necessarily force one to adopt a nativist stance. In principle, it is conceivable – if there are autonomous aspects about grammar, actually – that these aspects come in company with the usage-based development of grammatical and pragmatic competence drawing on multiple sources of general cognition.

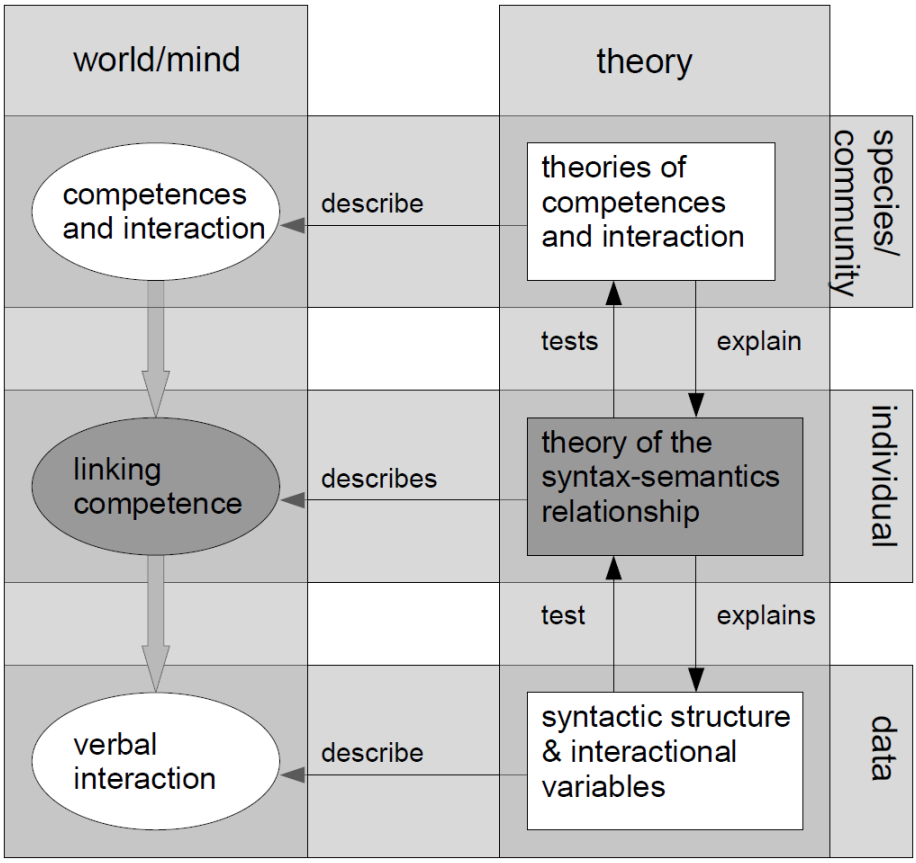

Figure 2.3: "Data", "individual", and "species/community" levels of the model (final version)

The core of the indeterminacy problem is that the theory of the syntax-semantics interface must be open enough to allow for any occurring form of the linking competence and restrictive enough to rule out non-occuring forms of the linking competence. Since this competence broadly draws from two sources, general cognition based on perception and conceptualization, and socioculturally-based interaction, the actual character, or constitution, of both perception, conception, and action restricts what is possible and impossible for the linking competence. In order to make restrictions operative the intended theory, one has to have access to perception, conception, and action, as well as to their descriptions. This lies far outside the scope even of hyphenated linguistics but it seems to be a necessary step towards the "recontextualization" of linguistic^{o} competence.

At best, then, all notions, mechanisms, "knowledge" structures etc. employed in the linking theory should be interdependently motivated. For this to be possible, the linguist has to widen his/her scope toward the scientific disciplines listed above which potentially provide converging evidence with respect to the linguist's topic. He/she has to look there for evidence for theoretical claims. Looking at Figure 2.3 above, the topmost level should be conceived of as the level of multidisciplinarity and converging evidence. On the right-hand side, i.e., the theoretical side, "theories of competences and interaction" designates any theory from whatever scientific discipline the subject-matter of which is some general or specific cognitive competence potentially contributing to the cognitive grounding of language or the modes, manners, governing factors, and so on of interindividual interaction, potentially contributing to the sociocultural grounding of language. On the left-hand side there is

consequently any phenomenon in the world reflecting instances of actualized cognitive or interactional competences and interactions themselves.
The level in the model on which these matters are located is the "species/community" level. In section 2.2.1 the individual has been conceived of as being naturally and culturally bound. The distinction between nature and culture has been explicated by reference to the individual's "opposition" both to the species and to the community. But is this distinction necessary? Is it not possible to reduce culture/community to the species, i.e., to nature? Should it not be possible to "naturalize" culture as well, including all forms of human competences and accomplishments (cf. Quine 1951, 1969)? According to Hartmann (1998: 3; my translation)

> "naturalism is in error because of its attempt to put itself in an absolute observer perspective – divorced from any participant perspective. […] This becomes most obvious in the 'naturalization of epistemology' programme: epistemology and the philosophy of science shall be transformed into natural scientific theories which ought to explain the attainment of our knowledge – and therefore also knowledge formulated by natural scientific theories themselves – in terms of causality."

This does not mean that there are no empirical findings possible concerning the attainment of knowledge. But according to Hartmann (1998: 4, my translation)

> "[w]hat such theories as a matter of principle cannot accomplish is to provide criteria for knowledge itself, i.e., criteria for differentiating true from false. Rather, such criteria, for assessing the validity of scientific theories, are required beforehand. Criteria of validity cannot be determined by empirical theories because they are normative. […] Criteria of validity as criteria for one's claim for validity […] can only be justified internally, in the context of the perspective of joint participation in a speech and communication community."

Taking the observer's perspective on one's own communication community is possible as long as one's involvement in this community as a participant is respected.
In a similar vein, the distinction between community and species should be conceived of as one of aspects. While the natural sciences investigate *homo sapiens* as a natural object, the social sciences investigate him/her as a purpose-rational political being. Culture is a factor because humans act together purpose-rationally. Animals do not (cf. Tomasello 2008). From a juridical and moral perspective, they are not (made) "responsible" for the effects of their behavior. Finally, they do not carry out scientific investigations and do not claim validity for their assertive speech acts (cf. Janich 2010).
The species/community level in Figure 2.3 is thus compressed. It comprises many different scientific disciplines – natural sciences and humanitites – with different subject-matters and must be conceived of as expandable to the sides where each scientific discipline unfolds its own research programme built around its subject-matter. This is schematically captured in Figure 2.4.

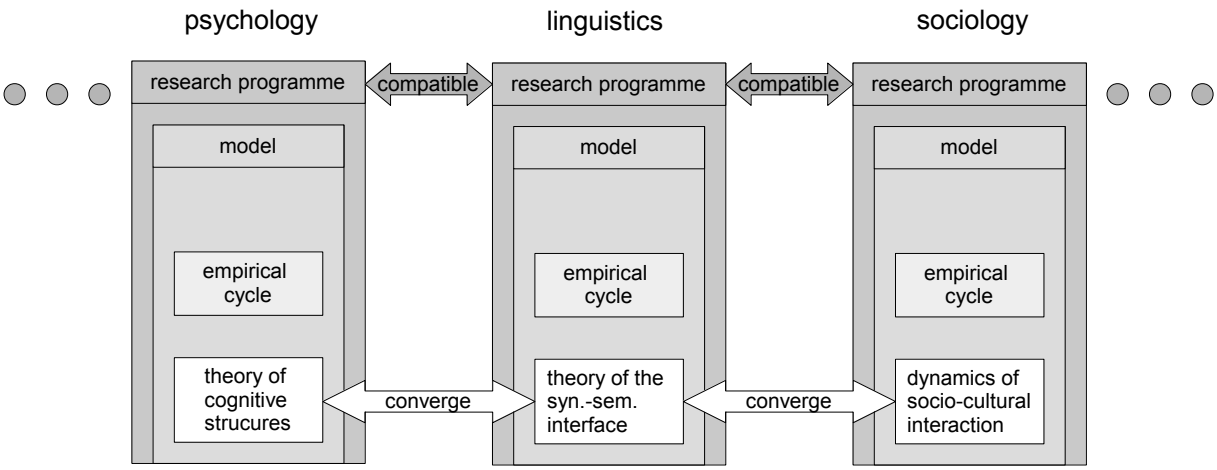

Figure 2.4: Multidisciplinarity and converging evidence

The shading of Figure 2.4 is of no particular importance except that of the subject-matter of the respective research programmes. Their color corresponds to that in the model developed here. Any scientific discipline or sub-discipline works in accordance to a specific research programme. This is constituted by a model which sets the empirical cycle in motion. As far as important aspects of the research programmes are compatible with one another, as far as their subject-matters are overlapping, and as far as their results provide converging evidence, this restricts the range of possible theories in any one of the research programmes considerably. The triple-dot punctuation marks to the left and to the right indicate that research programmes from other disciplines can be added. In this Figure psychology and sociology have been chosen as examples in order to illustrate how converging evidence with respect to the doubly grounded linking competence could be gathered. Psychology contributes to its cognitive grounding, sociology to its sociocultural grounding. In parts II and III of this work, several sub-competences of the linking competence are identified and characterized. These sub-competences are subject-matters of different scientific disciplines like the aforementioned psychology and sociology. For each section dealing with these sub-competences I will therefore give a partial research-programmatic model in the style of Figure 2.3 in order to indicate the notions to be developed and to make possible the reader's orientation in my argumentation.

2.3 Excursus: a brief sketch of "Chomskyan Linguistics"

It might be helpful at this point to see how the programme behind Chomskyan Linguistics fits into the concept of research programme developed by ten Hacken (2009). The first reason for this is that "Chomskyan Linguistics" is actually the topic of ten Hacken's work. The second reason is that it provides a level (in fact, a meta-metatheoretical one) on which models can be compared. The model underlying Chomskyan Linguistics is given in Figure 2.5.

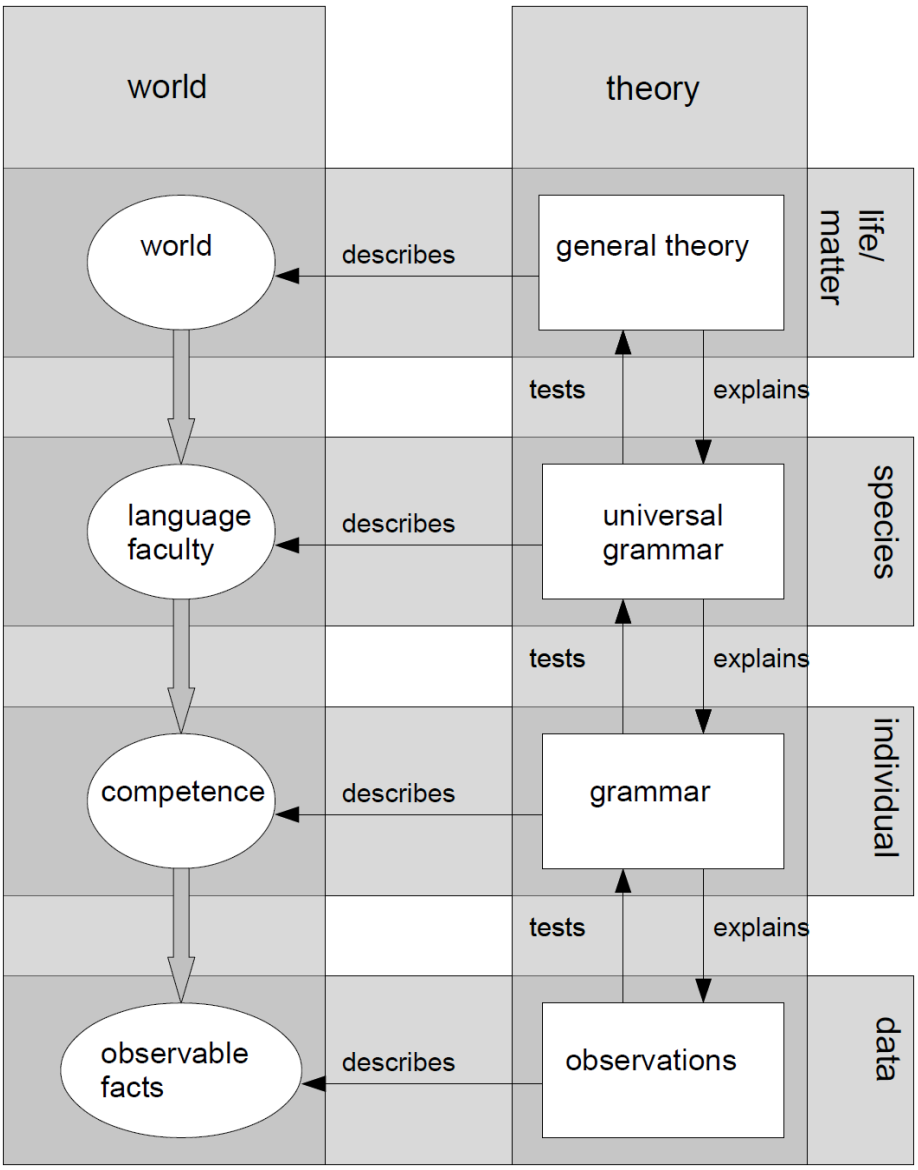

Figure 2.5: Model underlying the research programme of Chomskyan Linguistics (modified adaption from ten Hacken 2009: 120; (c) Equinox Publishing Ltd 2007)

As in the case of my own model, the ovals on the left side correspond to things in the real world and are therefore observable facts or (presumably) facts that can (presumably) be observed in some future time, as far as they have a material basis. On the right side rectangles stand for theories (and observations, respectively) which describe things in the world.

On the "individual" level (which is solely biologically characterized) a "grammar" is a theory which describes the speaker's "competence" as a fact in the world. At the same time the grammar (from now on unambiguously understood as a theoretical construct) explains the data on the lowest level. The data in turn test the predictions of the grammar. Grammar corresponds to theory$_1$ in the description of the empirical cycle in section 2.1.1 above, relative to "universal grammar" (again, a theoretical construct) which constitutes theory$_2$. That means, with respect to the empircial cycle universal grammar covers a greater range of observable facts in the world, since competence (as a matter of the individual and described by grammar) is "only" an instantiation or a derivate of the more inclusive, genetically anchored language faculty which is described by universal grammar. Furthermore, universal grammar has a

greater explanatory depth, since it is (considered to be) able to answer the "why?" of competence, while grammar is only able to answer its "how?". The testing function of grammar with respect to universal grammar lies in the fact that universal grammar must be compatible with all existing and possible instantiations of competence, i.e., with all existing and possible "I-languages".[52] According to ten Hacken (2009: 106ff.), the topmost level of the model constitutes the last step throughout the succession of theories within CL, i.e., the one from Principles and Parameters (Chomsky & Lasnik 1993) to the Minimalist Program (Chomsky 1995). The programmatic character of the latter becomes apparent in the fact that the "why?" of the language faculty is not presently in the scope of the "General Theory" (ten Hacken 2009: 120) which is a concept of the future.

What are the absolute assumptions underlying the model and setting the empirical cycle in motion? Subject-matter of CL is the generative capacity of a mature speaker, i.e., some form of knowledge or "competence" (cf. Chomksy 1965: 3ff.). Competence is not only independent of particular languages and ultimately located in the human brain but also separated from actual performance, i.e., some form of acting, which is "only" the externalization of something internalized. This (methodically motivated) separation is accompanied by another one, that of grammaticality and acceptability. The former is attributed to competence and the latter to performance (cf. Chomsky 1965: 11). From another perspective, competence, taken as "grammatical competence", should be distinguished from "pragmatic competence".

> "For purposes of inquiry and exposition, we may proceed to distinguish 'grammatical competence' from 'pragmatic competence', restricting the first to the knowledge of form and meaning and the second to knowledge of conditions and manner of appropriate use, in conformity with various purposes." (Chomsky 1980: 224)

With this, the subject-matter has been reduced not only to some form of knowledge located in the brain but also by its pragmatic components. From a third perspective, competence, as "I-language", i.e., that part of the mind which constitutes linguistic[o] knowledge, is contrasted to "E-language", i.e., the aspects of language that are considered to be independent of matters of mind and brain (cf. Chomsky 1986: 20ff.).

Thus, repeatedly separating the subject-matter of the programme allows one to single out the aspects required to set the empirical cycle in motion. The available data, i.e., the sort of data that are relevant for the research programme, are restricted to grammaticality judgments of native speakers of a language, due to the focussing on (grammatical) competence/I-language. Grammaticality judgments are the only "access points" to competence (cf. Chomsky 1986: 36ff.). Grammaticality judgments, i.e., a rather poorly designed type of experiment utilizing introspection, supplies rich data of high relevance, insofar as they provide evidence for competence (cf. ten Hacken 2009: 56). Hence, the observable facts in the model shown in Figure 2.5 correspond to all those verbal expressions (whether they are drawn from corpora or construed) about which grammaticality judgments can be made. The latter constitute the observations, then, i.e., the data. A grammar is a theory of the competence of the individual on the basis of such data. This theory is descriptively adequate, if it describes competence

[52] This is true not only for interpersonal variation in I-language but also for the states language learners go through as initial, intermediate and final states of I-language. Every one of these states is describable as an I-language (cf. ten Hacken 2009: 84). Every I-language in turn corresponds (logically) to a grammar (cf. Chomsky [2]2002: 64).

correctly (cf. Chomsky 1965: 30ff.). It seems important in this context, to see what Chomsky means by asserting that competence is "real". Ten Hacken's exegesis of several expressions of Chomsky has demonstrated that not every aspect of a mental operation "transforming" one structural description to another is considered mentally and physically real by Chomsky. In other words, only structural descriptions themselves are "real", i.e., located in the brain, while derivations are artefacts in the sense of descriptive means of the theoretician (cf. ten Hacken 2009: 68–70, mainly on the basis of Chomsky 1965: 9).

Up to this point, the most important absolute assumptions have been clarified as well as the way in which data can be gathered and which observable facts are relevant with regard to these assumptions. The next problem of the empirical cycle is the question as to which generalizations one should make on the basis of the data, because the latter suffer from indeterminacy such that they allow an indefinite number of generalizations (cf. ten Hacken 2009: 73ff.). This means that there can also be an infinite of grammars for these data. Chomsky (1962: 550) claims that the theory should be "insightful" and "true". This does not only mean that is has to be able to specify the "correct" generalizations but also that one must be able to evaluate concurring theories in order to determine the one that is "true". "True" should be understood here relative to the degree to which the theory captures the mental or neuronal reality of the explanandum (cf. Chomksy 1986: 249f.).

Chomsky tackles the problem of indeterminacy by drawing an analogy between the linguist's task of finding the correct grammar and the child's task of developing the right I-language. The linguist operates on the basis of his/her data, the child on the basis of its primary linguistic input (cf. Chomsky 1965: 4). The child's task is, however, in a sense more difficult, since its data are considered to be deficient.[53] Chomsky concludes from this that the child has a genetic predisposition (i.e., the language faculty on the species level) that, when confronted with experiential data, i.e., primary linguistic input, leads to the development of I-language in the mature speaker (i.e., competence on the individual level; cf. Chomsky 1980: 134ff.). This is the language acquisition device (cf. Chomsky 1965: 47ff.). The problem of indeterminacy, i.e., indeterminacy of the child's primary linguistic^{o} data in the sense of the "poverty of the stimulus" is resolved by means of a criterion of learnability (of any possible I-language) coupled with a genetic predisposition for competence (restrictive enough to allow for only the possible I-languages; cf. ten Hacken 2009, sec. 2.4.1). The description of universals on the basis of which the child aquires a language (together with the data) is the subject-matter of universal grammar (i.e., the theory of the linguist). The search for universals is thus restricted to those which are part of the species-specific language faculty.

From the fact that the language faculty is species-specific, whereas competence is individually realized, it follows that there are many I-languages which are all "instantiations" of the language faculty. Furthermore, it follows from this that there are as many grammars possible as there are I-languages but that there will only be one universal grammar that has to explain each of these grammars. If universal grammar provides the identification of a descriptive adequate grammar which is the correct one among all possible grammars, then it is explanatorily adequate (cf. Chomsky 1965: 30ff.). It is now possible to associate the levels of adequacy in Chomskyan linguistics with the levels of the model. On the data level we find

[53] The primary linguistic^{o} data contain ungrammaical expressions, they are limited with respect to the constructions that are possible and rare, and the child has to rely on positive evidence (e.g., Sampson 2005).

observational adequacy, on the individual level we find descriptive adequacy and on the species level explanatory adequacy – as related to competence, in fact (cf. ten Hacken 2009: 89). The data supply the "what?" of competence, the grammar supplies the "how?" and UG answers its "why"?

The leading questions on the basis of which the model was set up were those concerning the nature of the knowledge of language and how it is acquired. They were answered – in brief – by recourse to an individual competence and a species-specific language faculty. In connection with the development of the Minimalist Program the leading questions were supplemented by two further ones, those of the physical basis of the language faculty and its evolution (cf. ten Hacken 2009: 109ff.). These questions as part of the programme were already in place in the 1960s (cf. Chomsky 1965: 59), but seriously dealing with them was far out of reach at that time (and maybe today, as well). Concerning the physical, i.e., neuronal basis of language, it will hopefully be possible one day to reduce all sciences engaged in investigating the same phenomenon – let's say competence – to one single discipline, a General Theory (cit. in ten Hacken 2009: 112). That means, a situation could be brought about in which "physics, chemistry, biology, psychology, and linguistics describe different aspects of the same world" (ten Hacken 2009: 120) such that their results can be related to each other. With respect to the model there is hope that the way in which the language faculty is realized in the brain will supply data for the investigation of the nature of the language faculty (FL). But here one faces the problem of indeterminacy again. How are the (potential) data to be interpreted? What constraints are there with respect to "sensible" generalizations? The idea is that such criteria could be found in the study of the evolution of language. The "narrow" FL (meanwhile defined as recursion only; cf. Hauser, Chomsky & Fitch 2002: 1573) is assumed not to have evolved gradually but developed saltationally, i.e., by a sudden mutation, and the crucial involvement of recursion in language is a case of alienating its original purpose, whatever this might have been. It was not communication, however, which is rather a side-effect of the presence of recursion in *homo sapiens* (cf. Hauser, Chomsky & Fitch 2002: 1571). The uppermost level thus asks for the "how?" and "why?" of FL. At the same time it is an interface between all those research programmes in other disciplines – those mentioned above – which pursue similar goals, thus approximating the General Theory.

2.4 An action-theoretic vocabulary grounded in lifeworld differentiations

- In the previous sections I have outlined a research programme and its organization, i.e., the relationships among its constitutive parts (in the horizontal dimension of the model: levels, in the vertical dimension of the model: domains). The linking competence lies at its heart. It is clear from the multidisciplinary programme that a proposal of a theory of the linking competence will include much talk about cognitive and actional matters, bringing together results from several scientific disciplines. Therefore, this section will serve to construe a terminological basis on the basis of which to talk about these

heterogenous results. This will conclude the research-programmatic part I.

The present account of cognition and action will attempt a bottom-up approach as regards the embedment of the talk of both kinds of activities in everyday praxis. This is not to declare flawed all research results with respect to cognition and action but to approach them from the perspective of lifeworld differentiations (cf. Schütz & Luckmann 2003: 29ff.). As has been outlined in section 2.2.7, research programmes are limited in their ability to establish criteria for the validity of theories. The philosophy of science must establish them as norms. Research programmes, as the one outlined above, are then not self-contained constructs but depend on their embedding in our everyday praxis the constitution of which provides the criteria in question.

The argument of the following sections is thus as follows: According to the research programme pursued here, theories (and therefore theoreticians/observers) are part of what they describe (world/mind). The terminological tools theoreticians use to describe their subject-matters must therefore be based on those differentiations which are grounded in everyday praxis and which are therefore intersubjectively accessible and acceptable (cf. Ryle 1990, von Wright 1974, 1977, Janich 2001, 2006, Schütz & Luckmann 2003). The differentiations grounded in everyday praxis can be stated in terms of an action-theoretic taxonomy (cf. Hartmann 1996, 1998).

The theory of the linking competence proposed here will utilize this taxonomy, thus enabling the traceability of its theoretical notions. In particular, decisions about the possession or non-possession of competences rest on differentiations made by groups of individuals constituting sociocultural praxes. In what follows, the action-theoretic terminology will be developed.

The mind is not an object like tables, cars, or brains are. However, the list (B A1) to (B A4) in section 2.1 does contain mostly cognitive competences (as well as the physical competence for physical action), namely perceiving, knowing, attending, sharing knowledge, planning, imagining, and thinking. These competences are preconditions of the linking competence, another partially cognitive competence. If the mind is not an object, what is it? It is not the purpose of this book to deal primarily with this problem, as it is perhaps the most disputed one in the history of philosophy and – nowadays – natural sciences (cf. Beckermann ^{3}2008, e.g., Haggard 2001, Hallett 2007, "Manifest"[54]). Instead of this, I shall propose a new way to talk about such psychological notions from the perspective of our everyday needs and from the perspective of an already functioning communicative praxis which is the ineluctable reference for any differentiation. As Luckmann (1992: 1; my translation; see also Schütz/Luckmann 2003: 29) puts it,

> "[t]hose sciences aiming at interpreting and explaining human action must start with a description of the reality of everyday life which we take as granted. It is the reality in which the human being participates repeatedly, this participation being inescapable and continuous."

[54] In this manifesto, eleven leading neuroscientists announce that neuroscience will soon be able to explain and predict psychical processes. They identify the freedom of will – traditionally one of the great philosophical topics – as one of the great questions of neuroscience.

We can term this reality which is the ineluctable instance for all of our judgments "lifeworld" (cf. Schütz & Luckmann 2003, chapter 1). Because even the theoretician has nothing besides language to talk about his/her phenomena and results, it is plausible even to ground one's scientific language in ordinary language so that descriptions of phenomena and results do not lose contact to the instance that is able to judge it valid or invalid. The way of talking about perceiving, knowing, imagining etc. is the result of our everyday interplay with our environment and interaction with each other, which allows for intersubjective accessibility. This allows us to refer technical notions of psychology to differentiations acquired in everyday experience in our lifeworlds as they are present in ordinary language use (cf. Hartmann 1998: 8ff., Hartmann & Lange 2000, Janich 2006: 391ff.). Applied to the model underlying the proposed research programme (Figure 2.3) for which it has been claimed that theories are also part of the world, this means that the terminology construed applies to both the theory and world/mind dimensions at the same time, thus neutralizing the observer's and practitioner's points of view in the sense that any observer is necessarily at the same time a practitioner.

I use the term "interplay" here to differentiate it from "interaction" which shall be reserved for what is usually called "intentional action" towards each other and which is opposed to mere "behavior" (see below). Interaction requires two agents, i.e., some symmetry between its participants. Interaction is then always a form of acting together, of co-operation. Many action schemas can only be actualized in the form of acting together, e.g., selling and talking. In contrast, "interplay" shall designate any affection of the sense-organs of the individual through the environment and any behavior or action of the individual toward its actually non-agentive environment.[55] By "environment" everything is meant which can affect the individual's sense-organs or can be affected by the individual's behavior or action. Because these "affections" are also involved in human interactions, our potential interactants are also parts of the environment. The differentiation of interplay and interaction is a descriptive one, one of aspects of the same "thing", namely an individual's relation to its environment.

The taxonomy of notions proposed in this section is then a result of the successful differentiations we make in our everyday engagement with our interactants and our environment in that we enact these differentiations. What follows is a reconstruction of psychological notions in accordance with the subject-matter of the programme presented, namely a doubly grounded linking competence.

In the course of our encounters with others and with our environments we learn to distinguish objects from states, processes, and activities in which objects occur. The latter can together be labelled circumstances.[56] In states some aspect or status of an object, or a relation between

[55] According to the Oxford English Dictionary, the noun "interplay" means 'mutual operation of two things or agents in influencing each other's action or character'. Accordingly, the intransitive verb "to interplay" means 'to exert mutual influence'.

[56] Thus, "circumstance" is a cover term for any conceivable form of appearance of an object. The following taxonomy is a modification and in certain parts elaboration of Hartmann's (1998) work in which he attempts a methodological reconstruction of important psychological notions in the context of his proposal of a "proto-psychology" (cf. also Hartmann 1993, 1996, 2006). He makes use of ordinary language in this attempt (see also Ryle 1990 [1949]) in order to relocate the theoretical notions employed in psychology in our everyday praxis. This shall prevent the scientific discipline psychology from the hypostatization of their theoretical constructs (see also Foley 1937), i.e., for a psychology which does not keep track of the everyday praxis in its characterization of its subject-matter there is danger of "hypostatizing" its theoretical constructs. One example of such a hypostatization might be the "computational mind". Once invented as a heuristic for the exploration of

two or more objects remains constant through a period of time. A state would be constituted by a car standing in front of a house or a lamp hanging from the ceiling. If some aspect, status, or a relation between objects changes in time, for instance, the car's being removed from in front of the house by a flood or the lamp swinging because of ventilation, this is a process. In our everyday praxis we can also easily distinguish between states and processes on the one hand and activities on the other hand, where the latter term shall apply here to animate beings and the former to inanimate beings. Activity finds its expression in movement, whereas I reserve the term motion for the embodiment of processes. Examples of activities would be the laughter of someone, a dog's whining, or Alex' rolling himself down a hill.
States, processes, and activities can further be characterized according to two parameters. This is firstly their complexity, i.e., the number of their respective sub-parts. States do not have sub-parts because no changes occur in states. Processes may consist of only one part or may have two or more sub-parts, as in the event of a ball rolling from the living-room through the vestibule into the kitchen (for details on the defining characteristics of sub-parts see section 3.4). Activities work similarly. States, processes, and activities can secondly be characterized with respect to the number of objects that are involved in them, i.e., whether they are monadic, dyadic, triadic etc. (adicity). The taxonomic distinctions so far are captured in Figure 2.6.

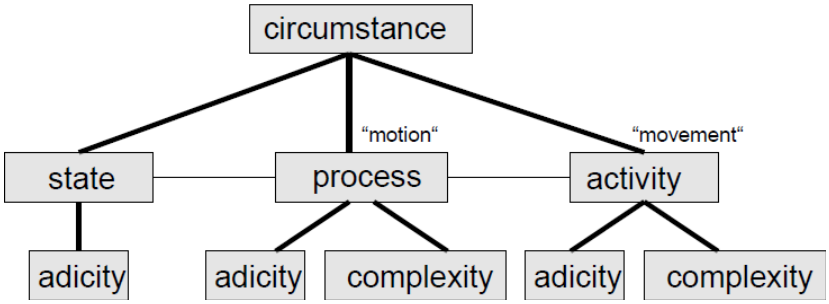

Figure 2.6: Types of circumstances and their characteristics

Table 2.1 illustrates the role of the complexity and adicity parameters.

complexity (no. of sub-parts)			circ.-stance	adicity (no. of participant things)		
		1	state	1	2	3
3	2	1	process	1	2	3
3	2	1	activity	1	2	3

Table 2.1: Complexity and adicity of states, processes, and activities

We can now reconstruct the usage of the terms "situation", "event", and "relation". A situation is a state of any adicity (see Table 2.2).

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cognitive skills, it was increasingly taken literally until the mind was indeed considered a computer (cf. also Lakoff & Johnson 1999, chapter 12).

complexity (no. of sub-parts)			circ.-stance	adicity (no. of participant things)		
		1	state	1	2	3

} "situation"

Table 2.2: Situation

An event is a process or activity of any adicity in which "something happens", i.e., where complexity > 1 (see Table 2.3).

complexity (no. of sub-parts)			circ.-stance	adicity (no. of participant things)		
3	2		process	1	2	3
3	2		activity	1	2	3

} "event"

Table 2.3: Event

Finally, a relation is given when adicity > 1, where complexity is irrelevant. This is given in Table 2.4.

complexity (no. of sub-parts)			circ.-stance	adicity (no. of participant things)		
		1	state		2	3
3	2	1	process		2	3
3	2	1	activity		2	3

} "relation"

Table 2.4: Relation

Another distinction we acquire through everyday praxis is that between behavior and action. These are the two types of activity (or movement).[57] The distinction between these two is of great importance. Behavior can be described as those movements which can perfectly be explained in terms of biology, physiology and other natural sciences, since these discinplines are, or claim to be, able to causally explain the occurrence of behavior in terms of natural laws

[57] In most psychological works, the term "behavior" subsumes both what is here called "behavior" and "action" (e.g., Engelkamp & Zimmer 2006).

(i.e. laws about activity patterns of the type: Every time something of kind A happens, B occurs afterwards). These causal explanations in terms of natural laws cannot be applied to acts, since they can be desisted from, i.e., their occurrence can not be captured by such laws. In fact, natural laws for the occurrence of action do not exist (Hartmann 1993, 1998). Examples of behavior would be breathing, the heartbeat or yawning. Examples of action are writing a letter, buttering bread, running, singing, and eating.

Any state, process, or activity that is not an act of ours but involves us "happens to" us. These "happenings" include, e.g., our own behavior, the behavior and especially the acts of others. Acts can be successful or they can fail. Due to the success or failure of our own acts we may incur happenings even with respect to our own acts: A failed attempt to open a tin "happens to" us. All instances of successful accomplishment of a particular act, e.g., opening the window, making coffee, washing dishes, can be schematized, resulting in action schemas (see also Cooper & Shallice 2000, 2006). An action schema is actualized when a particular result of an action occurs, i.e., the bringing about of a circumstance as the result of an act. When I have made coffee successfully, i.e., there is coffee after my acting, then I have actualized the action schema of making coffee, since the resulting state of there being coffee is the condition for the foregoing action to be an instance of the schema "making coffee". Most actualizations of action schemas are for the greater part associated not only with particular resulting circumstances but also with further outcomes. A further outcome of my making coffee could be a messy kitchen. It is, however, not necessarily but contingently tied to the action schema "making coffee" and its (necessary) result of there being coffee.

In the course of our lives and our everyday experience we gain encyclopaedic knowledge about the outcomes of our actions. We use this knowledge to fulfil our needs. When I turn on the light, the action schema "turning on the light" is actualized iff the light is on. My need is, however, to get something out of the room in which it is dark, and a further outcome of the actualization of the action schema "turning on light" is that it is bright in the room after I have turned on the light to find what I am looking for. Therefore, we use our knowledge about the further outcomes of our acts for the sake of bringing about particular circumstances. These are called purposes. Purposes are either goals, i.e., states, processes, or activities which have to be brought about, or interests, i.e., states, processes, or activities which shall be maintained or avoided. Outcomes of acts that are not purposed are called side-effects. If a purpose is achieved, the act has been effective; if not, it has been ineffective. Most purposes can be identified with further outcomes of action. But there are also cases in which a purpose coincides with the (necessary) result of an action, e.g., if someone writes poems to write poems. These acts are acts with an end in themselves. Some aspects of action are captured in Figure 2.7.

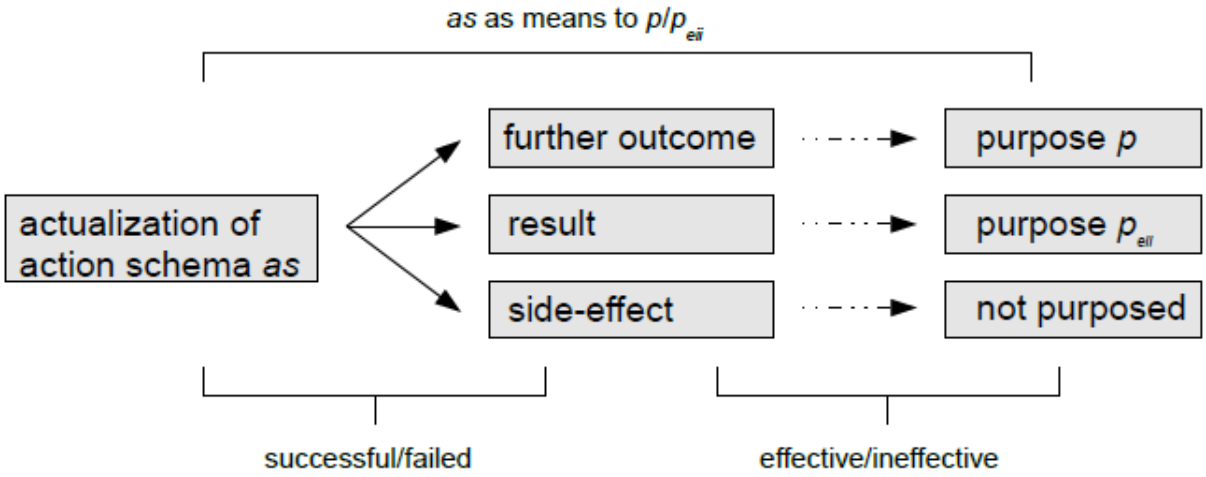

Figure 2.7: Aspects of the relationship between action schemas and purposes (p_{eii}: purpose consists in actualizing an action schema (as) as an act with an end in itself)

Many action schemas are actualized by actualizing other action schemas, as_1, as_2, as_n first (think of making coffee, for example; cf. Jackendoff 2007: 123ff., Cooper & Shallice 2000 on accounts of the making coffee-schema using hierarchies). Then, *as* is mediated by as_1, …, to as_n. The latter are known as ancillary action schemas. Acts that do not support others are basic acts. The defining criterion for a basic act is how it is learned: It cannot be learned by the step-by-step acquisition of partial action schemas but only as a whole (e.g. washing one's hands consists of different steps learned independently of one another, while clenching one's fist is a unified whole, in that one need not learn to bend each limb separately).

Those action schemas that are usually effective with respect to a particular purpose *p* when they are achieved are means to *p*.

In order to put into effect a particular purpose it might be necessary to put into effect other purposes first. I call the former the superior purpose *p* and the latter subordinate purposes p_1, ..., p_n, where subordinate purpose p_1 might be subordinate to a "higher" purpose *p* but at the same time be the superior purpose in relation to a yet "lower" purpose, p_2. When several actions must be executed in a strict order to put into effect a highest purpose *p*, this is called an action chain (cf. Cooper & Shallice 2000 for a similar account). This is schematically depicted in Figure 2.8 below:

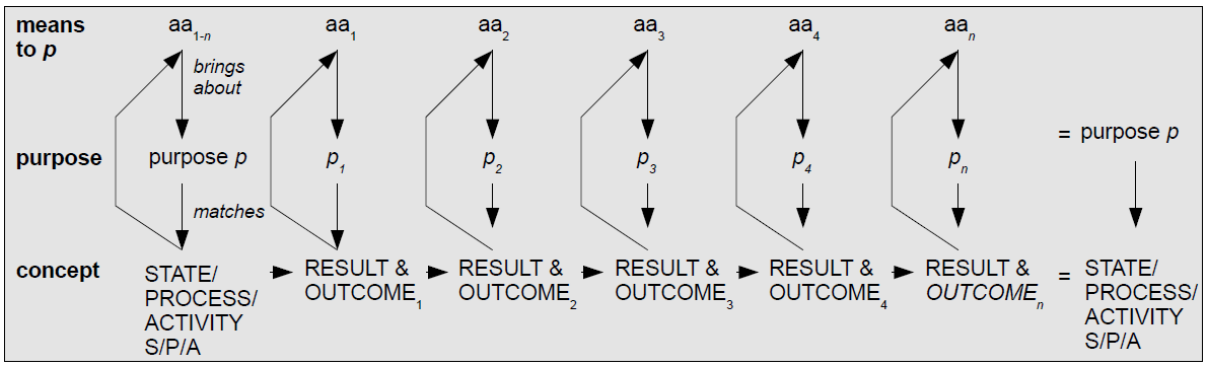

Figure 2.8: Action chain

*(Figure 2.8 can be read as follows: Someone has a purpose (*p*), i.e., wants a state/process/activity to come about. He/she therefore conceptualizes this*

STATE/PROCESS/ACTIVITY and the means to put it into effect in terms of action schemas ($aa_{1\text{-n}}$). He/she actualizes the corresponding ancillary action schemas in sequence ($aa_{1\text{-n}}$), whereby he/she brings about several states/processes/activities which are results and outcomes of ancillary acts ($p_{1\text{-n}}$) (see Figure 2.7). They must match the conceptualized intermediary states/processes/activities (RESULT & $OUTCOME_{1\text{-n}}$). (A feedback mechanism (not depicted) provides that unexpected or undesired results and outcomes lead to a modification of the means to get to purposes $p_{1\text{-n}}$ or p, respectively.) If the final state/process/activity is brought about, purpose p *is put into effect.)*[58]

When a purpose is put into effect by concerted (successive or simultaneous) action of several persons, this is referred to as the interdependence of acts. Schematized and person-invariant interdependences of action are praxes. Praxes are then dependent on co-operation which has been characterized above as the constitutive feature of interaction. Any form of verbal communication is then constituted by concerted action and cannot occur in the absence of less than two agents. With these action-theoretic clarifications (made on meta-theoretical grounds here) one can catch up on the talk about a praxis being one precondition for our verbal interactive competence as claimed in section 2.1. Taken together, all forms of action comprise a culture, as these things are passed on from generation to generation within a community (cf. Tomasello 1999, 2008).

There are many events especially relevant for living beings insofar as they serve or hinder their survival. Living beings tend to act or behave in regular ways toward such events. If this is the case, one can talk about a movement (or activity) schema. This schematization of movement, and, as has been introduced above, of actions, can also be extended to motions (or processes), behaviors, and even to situations, events, and relations. There are then, relation schemas, event schemas, situation schemas, movement schemas, motion schemas, action schemas, and behavior schemas.

Reaction schemas are one type of behavior schemas. They can regularly be caused by certain situations which are stimuli and the corresponding objects in these situations are stimulus objects. Reaction schemas contributing to the survival of a living being or species are need-satisfying. The summation of circumstances in which a living being might find itself is its environment (i.e., where interplay and interaction take place). It might be necessary for a living being to face novel circumstances. Insofar as it learns new life-sustaining reaction schemas for them, it adapts to its environment. The distinctions made so far are summarized in Figure 2.9 below.

[58] By way of exception, the notions “concept” and “conceptualization” must be forstalled here. They are discussed in extenso in sections 3.1 and 3.2.

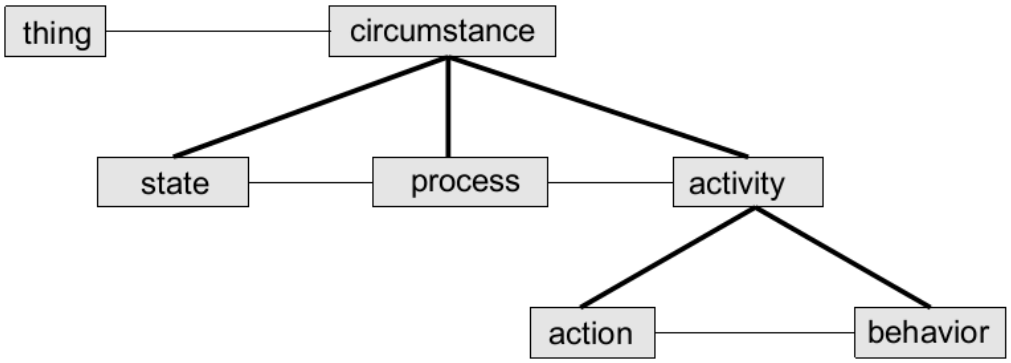

Figure 2.9: Thing-circumstance taxonomy (inspired by Hartmann 1998: 64)

Most differentiations have been introduced here in terms of physical processes and activities, although it is obvious that this is insufficient with respect to our subject-matter, i.e., some form of (largely) cognitive competence drawing from other cognitive competences. Even if any cognitive activity has a neuronal correlate, talking about cognitive activities in terms of neurophysiological terminology will not be auspicious. So we need a cognitive psychological terminology in order to talk about something which is different from neuronal matters in aspect. The proposal given here is to ground our talking about cognitive activities in terms of the above taxonomy (Figure 2.9) as drawn from our actual experiences of our interplay and interaction with our environment. The taxonomy in Figure 2.9 can then be applied to physical circumstances as well as to cognitive ones.

First, it shall be clarified what competences are (see also section 2.1). Naturally, competences are not objects but properties that become significant only with respect to something "enacted" or "executed". Now, one masters an action schema if its actualization is regularly successful. One who masters an action schema has then the competence to actualize it. It was mentioned above that the actualization of action schemas can either succeed or fail. If the actualization of an action schema is successful, its result is an accomplishment. If it fails, the result of the act is a misaccomplishment. The talk about competence applies to both physical and cognitive activities. How can one tell physical and cognitive states and activities apart? With respect to action schemas, opening a door is naturally a physical action schema, while solving equations "in one's head" is a cognitive action schema. "If one wants to know whether a particular action schema is a cognitive action schema, one has to test whether it can be internalized in the sense that the corresponding result of the action can principally be realized "internally" – without being mediated by the usual physical action schemas." (Hartmann 1998: 77; my translation). For instance, one can solve an equation "in one's head" or on paper or both. In principle, this can be accomplished without a physical action schema (writing), so it is a cognitive action schema. In contrast, I have never heard of someone who seriously claims to be able to open a (real) door "in his/her head", so it is a physical action schema. Where a successful internal and a successful external actualization of an action schema (constituting the same accomplishment) leads to the same result, it is feasible with respect to "action schemas which can be internalized to allocate also the accomplishments made through physical mediation, the physically mediated actualizations themselves as well as the corresponding competences in general to the cognitive competences." (Hartmann 1998: 77; my translation). In other words, when solving an equation on the paper, this is a cognitive action schema because it can be internalized. At the same time it is physically mediated.

Solving it "in one's head" and on paper leads to the same result – the successful solution of the equation, which is at the same time an accomplishment. Now the accomplishment made through physical mediation, i.e., the solution on paper, and the physically mediated actualizations, i.e., the process of solving the equation on paper, and all the physical competences that are necessary to solve an equation are also cognitive competences. It follows from this that we cannot characterize talking (as interacting verbally) as a cognitive action schema. Talking, as concerted action, cannot be internalized and is necessarily physically mediated. Reasoning which I take to be an individual, simulated verbal activity is, on the other hand, a cognitive action schema.[59]

Cognitive activities are not exclusively instances of action, of course (cf. the "cognitive unconscious" of Lakoff & Johnson 1999: 9ff. as one facet of the "embodiment" concept in Cognitive-Functional Linguistics; Jackendoff 2007: 77ff.), i.e., they can often not be desisted from, since we are not aware of them. They are cognitive happenings, then, in the sense that they simply "befall" us: Sometimes things, persons, events, and things that we should have done etc. "come to our minds" or we see things that are not there. These are clearly instances of states and activities that happen to us without our having purposed them.

Unlike acts, what happens to us cannot be differentiated into physical, cognitive and mixed happenings. The reason is that emotions also happen to us, i.e., they cannot be desisted from. We can only attempt to influence our emotions by acting, e.g., by trying to ignore the insults of someone in order to not become angry. The occurrence or non-occurrence of anger is then a further outcome of our attempt and in itself not an instance of action.

What happens to us cognitively can also be purposed. This seems inconsistent with what has been said before, because purposefulness is restricted to action. But cognitive happenings can occur as results of acts which are purposeful *per definitionem*. This yields cognitive accomplishments. Imagine you misplaced a book. You can actively (as an act) try to recollect the last moments in which you still had the book. From there you might reconstruct this time span and it might finally "come to your mind" where you put the book. This strategy (recollecting) does not guarantee success but the cognitive happening (you recollect the book's place) is a cognitive accomplishment in this situation.

Furthermore, the above clarifications allow one to reconstruct the term "cognition". In Cognitive Psychology the term is used rather broadly, encompassing mostly attention, perception, identification, knowledge, memory, learning, problem solving, thinking, and sometimes even speaking and acting (cf. Sternberg ^{4}2006, Solso 2005, Engelkamp & Zimmer 2005, Anderson ^{5}2000, Eysenck & Keane ^{5}2005). In addition, "cognition" mostly comprises cognitive activities as well as their results. In accordance with the above terminology we can state:

> "Cognitive acts, cognitive happenings, cognitive accomplishments as well as the results of non-purposed cognitive happenings [are] called cognitions – cognitive acts and happenings in the sense of cognitive events, cognitive accomplishments and non-purposed results of cognitive happenings in the sense of results of cognitive events." (Hartmann 1998: 80; my translation)

[59] For a more detailed characterization of "thinking" see Hartmann (1998: 164ff.).

What is "the mind", then? According to the programme pursued here it is a terminus of reflection, i.e., a term that is used to make assertions about cognitions in opposition to assertions about physical states and activites, and their results. Unfortunately, although it is a terminus of reflection, i.e., only a manner of speaking about some cognitive states and activities and results of them, the term suggests that there is such an object: "the mind". This reification easily leads to a type of category mistake, yielding literal scientific statements as "the mind knows…" (cf. Ryle 1990 [1949]: 17, 161, Hartmann 2006). Such a manner of speaking is the result of speaking about cognitions person-invariantly, i.e., in general. The same is true for the notion of "culture". Cultures are not objects, so talking about living "in" a particular culture, or about "having a culture of…" might be misleading without further clarification. The above construal of a terminology that is situated in the here and now of people perceiving and acting together allows characterizing culture as nothing more than those praxes (and their resultant artefacts) which are enacted here and now and which have been passed on from the past and will be passed on to the future. And insofar as a culture is constituted by praxes and praxes are constituted by individuals that act "we-intentionally" toward common goals, praxes and cultures are inherently social. As a result, talking about "sociocultural praxis" is highly redundant. Nevertheless, I will go on using this phrase, since it fits common usage and adds nothing inadequate.

2.5 Summary of part I

In chapter 1 and part I I have proposed a research programme within which a theory of the syntax-semantics relationship will be developed. The research programme gets its legitimation through the fact that the prevalent research programmatic frameworks, Chomskyan Linguistics and Cognitive-Functional Linguistics, have reduced their subject-matters by performance, use, and by actional matters that go beyond individual cognition, respectively. The subject-matter of the present programme has been identified as the linking competence, i.e., using verb-complement structures in a well-formed and appropriate manner to code semantic contents. The data to be used are linguistic^{o} data embedded in verbal interactions including interactional variables. In the context of semantic description it has been demonstrated that predicate-argument structures are a theoretically problematic descriptive means. From the perspective of research programmes, they are borrowed from a different context, namely truth-oriented philosophy.

Among the basic assumptions of the proposed programme are those that concern several sub-competences of the linking competence, i.e., perception, conceptualization, intersubjectivity, action competence, and the competence of sign-use, i.e. associating syntactic structures and semantic contents. The most important aspect of the linking competence is thus that it is grounded both in perception, i.e., natural sub-competences, and in action, i.e., cultural sub-competences. The way in which these sub-competences enter and shape the linking competence and thus linguistic^{o} forms makes it necessary to go beyond the boundaries of linguistics and to look at what cognitive psychology, neurosciences, sociology, and social psychology can contribute to the linking competence. The research results from these disciplines together with linguistic^{o} evidence restrict – by converging evidence – what is

possible and what is not regarding the linking competence. The actual, observable, and successful verbal interactions enacted in speech communities constitute the standard of what is to be explained.

The talk about mostly cognitive competences was finally embedded within an action-theoretic vocabulary based on intersubjectively acceptable lifeworld differentiations. This is too part of the research programme and its conception allows to treat the theoretician as the object of his/her own theory.

Part II: Grounding the linking competence in sub-competences

Introduction

The following chapters serve to explicate the assumptions (B A1) to (B A4) from section 2.1 in detail. I will show how each of these (sub-)competences contributes to our competence to interact successfully verbally.[60] In particular, their contribution to the performances of Sarah and Jessica in the below scenario repeated from earlier sections will be outlined.

(II.1) The three-year-old twins Jessica and Nicole are at dinner with their parents Sarah and Marc. Nicole reaches for the milk carton. She grips it only with her fingertips, causing it to fall down. It falls off the table and runs all over the floor. Jessica and her mother have kept track of what happened.

(a) Jessica: *Nicole hat die Milch runtergeworfen*.
Nicole.3NOM have.3AUX the.ACC milk down-throw.PTCP
'Nicole knocked over the milk.'

Sarah: (hesitating, looking at the surprised causer)

(b) *Nein, sie ist ihr runtergefallen*.
No it.3NOM be.3AUX her.DAT down-fall.PTCP
'No, (it happened to her that) it fell down.'

Jessica: … (not signalling misunderstanding)

The first sub-competence presented is perception. The matters discussed in the respective sections are cognitive psychological ones. In the context of the research programme and its underlying model they can be located at the species/community level where different scientific disciplines – here: cognitive psychology – contribute to an adequate characterization of the linking competence at the individual level.

- In particular, I will split perception into a bottom-up part (sensation; section 3.1) and a top-down part (identification; section 3.2), and I will characterize conceptualization as simulated perception. The idea is that neither of them sufficiently provides Jessica and Sarah the information necessary to make their utterances in a well-formed and situationally appropriate manner (sections 3.2.1). Rather, perceptual and/or conceptual data must be complemented by actional, or attributional, knowledge. These matters are traditionally discussed in philosophy (action theory), sociology, and social psychology

[60] Perception, conception, action, etc. are "sub-"competences only relative to the linking competence.

(attribution). The matters discussed in the respective sections can thus be located at the species/community level, too. Together with the cognitive psychological considerations they converge in the most important sub-competences that are central to the linking competence at the individual level. In sections 3.2.2 and 3.2.3 I discuss how actional, or attributional, knowledge relates to perception, how it is acquired, and what the regularities of its practical application are. Section 3.2.3 concludes with an empirical study considered to reflect the mechanisms in attribution that lead to Sarah's and Jessica's differential action. Sections 3.3 and 3.4 deal with how conceptualization is related to the syntactic structures underlying utterances, first from a spatial-conceptual and then from a temporal-conceptual perspective.

3 Perception, conceptualization, and action

The central assumptions to be developed in sections 3.1 and 3.2 are that perception can be shown to be the primary condition for conceptualization. In particular, conceptualization can be characterized as simulated perception. Both are underspecified with respect to socially highly relevant types of information. Section 3.2 thus proceeds with a characterization of the actor/cognizer, i.e., the one perceiving, conceptualizing, and acting (by speaking). It will be shown that his/her physical and cognitive constitution together with what will be called the underspecification of percepts and concepts bears central significance with respect to how the linking competence must be conceived. This discussion of the actor/cognizer leads to his/her action competence the main component of which will be demonstrated to be attribution. The latter is supposed to make up for this underspecification.

3.1 Perception

- The sub-competences of the linking competence that are developed in section 3.1 are given in Figure 3.1.

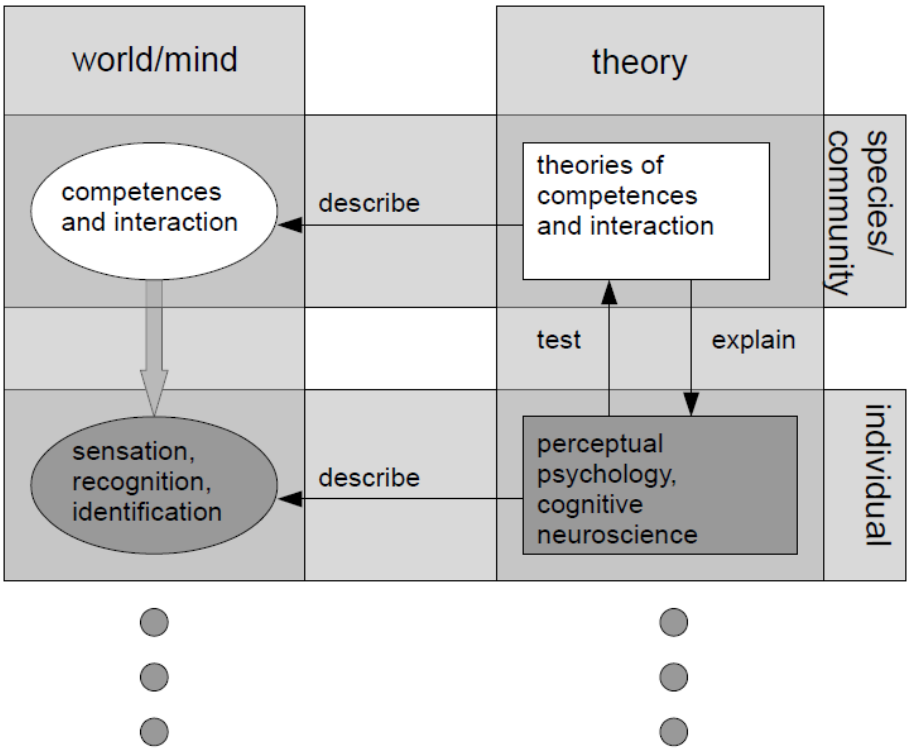

Figure 3.1: Sensation, recognition, and identification as sub-competences of the linking competence that are developed throughout section 3.1

3.1.1 Grounding the talk about perception in practical differentiations

> Perceiving is all about making differences in the objects and states, processes, and activities we encounter, we are involved in, or in which we engage. We differentiate by acting or behaving differently toward or with respect to different objects and circumstances. Thus, differences do not solely exist by nature but especially in dependence on someone who differentiates.

There are probably numerous life forms that differentiate between the "same" objects and circumstances in different ways from each other (cf. Bruce, Green & Georgeson [4]2003). That means life forms differ in their competences of differentiation and their differentiation accomplishments. We find here one more of the several meanings of "embodiment" as employed in CFL (see (C5 of CFL A1: embodied meanings) above; cf. Rohrer 2007 for an overview on meanings of "embodiment" employed in CFL). Embodiment in the present context means that the world in which we live, act and perceive is not simply given to us objectively but in a way that is restricted by the way in which human beings are able to live in it, act in it, and perceive it. What we perceive does not simply reflect the world as it is but what our biotic makeup makes possible for us to perceive. Only if we are able to differentiate blue from green objects, there "are" blue and green objects "in" the world for us.
Impairment of our sense organs or their neuronal pathways leads to decreased differentiation competences (for instance, in visual apperceptive agnosia, cf. Grossman, Galetta & D'Esposito 1997). Someone whose differentiation competence is impaired cannot actualize a

specific somatic movement schema by which he/she makes a difference.[61] In other words, he/she does not perceive a difference.[62] It is the failure in actualizing certain movement schemas which directs our attention to perception and its functioning. As a consequence, we can only be sure about what we and others perceive when people make differences by doing, i.e., by actualizing certain somatic movement schemas. Where one cannot differentiate, one does not perceive. Depending on the part of the body which is involved in making differences (which can be detected if the body part in question is impaired), we can identify different modalities of perception. We will concentrate here mainly on visual perception because of its overwhelming significance for linguistic^{o} competence (cf. Miller & Johnson-Laird 1976, Jackendoff 1983 et sqq., Lakoff & Johnson 1999, Langacker 1987 et sqq., Talmy 2000, Zlatev 2007, Evans & Chilton 2010).[63] It is important in this context that only those differences that have been perceived can also be communicated in a traceable manner, by description or other means. This does not mean that we can describe anything we perceive, since there are perceptions possible that have not been noticed by the perceiver (they are below a threshold and thus perceived "without awareness"; Merikle et al. 2001) but that have biased some of his/her actions or decisions. Nor does it mean that we cannot talk about perceptions we do not have, in the sense of ascribing them to someone.

Because perceptions come along as being constituted by somatic movement schemas, they occur as acts or behavior. It is easy to see why perceptions cannot be exclusively acts. Often enough perceptions simply happen to us, for instance, when we hear a scream or catch a glimpse of a falling star. Nevertheless, we can influence such happenings by blocking our ears or looking away from something. On the other hand, famous examples like the Necker cube (Figure 3.2) and the Rubin face (Figure 3.3) show that perceptions can also be acts. With a little practice it is easy to switch between the two possible percepts, i.e., the two recognizable forms.

[61] The somatic nervous system is part of the peripheral nervous system and underlies (controlled) body movement by skeletal muscles as well as sensory experience. In contrast, the vegetative (or autonomic) nervous system also belongs to the peripheral nervous system and underlies movement of internal organs. So, both somatic and vegetative movements can be subsumed under activities.

[62] Note that "making a difference" is identical with "actualizing a somatic reaction schema" here.

[63] Because this will be topic of later sections, the following comment shall suffice for now: the works of Langacker (e.g., 2008a) and Talmy (2000, I, ch. 3, ch. 5) have shown to what high degree grammatical structures respect spatial configurations, especially with regard to figure/ground configurations. Evans & Green (2006: 532) point out that Talmy's grammatical subsystem of conceptual structure depends on visual perception.

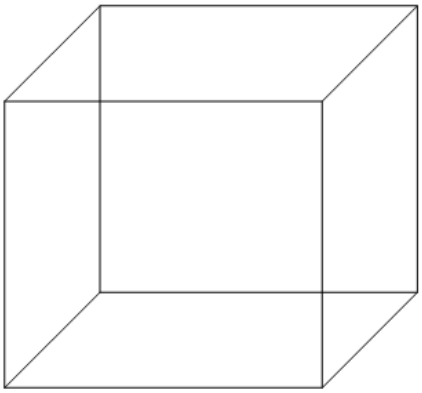

Figure 3.2: Necker cube
(cf. Inui et al. 2000: 146, Necker 1832)

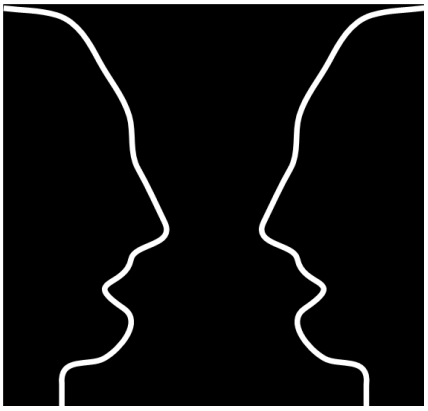

Figure 3.3: Rubin face
(cf. Davis, Schiffman & Greist-Bousquet 1990: 307, Rubin 1921)

Since perceptions can be internalized (or are exclusively internal) they are cognitive movement schemas, i.e. cognitive acts or cognitive behavior. Perception as action and perception as behavior can again be related to perceptual accomplishments and perceptual competence. When a perception happens to us (e.g., finding something) as an outcome of a perceptual act (looking for something with uncertain success), the perception is an accomplishment and we can talk about perceptual competence for both cognitive acts and cognitive behavior (as an outcome of action).
If perceptions can be successful, they can also fail. What are the criteria for successful or failed perceptions? The percept's correspondence to reality is not an option here, since it summons the god's eye view insofar as one needs immediate access to reality – access not mediated by perception. This is impossible. But if perception is all about making differences by means of actualizing certain somatic movement schemas, it is easy to see what makes perceptions adequate or inadequate, namely their suitability with respect to the actualization of certain movement schemas. If I want to read a book and actualizing the corresponding action schema fails because it is too dark to read then my perception has failed. This would be a case of my failure to perceive that it is too dark. Besides this, it might be the case that we "perceive" something that is not there – illusions or hallucinations (cf. Crane 2005, Huemer 2007 on discussion). Such an illusion occurs when looking at the Müller-Lyer illusion (Figure 3.4).

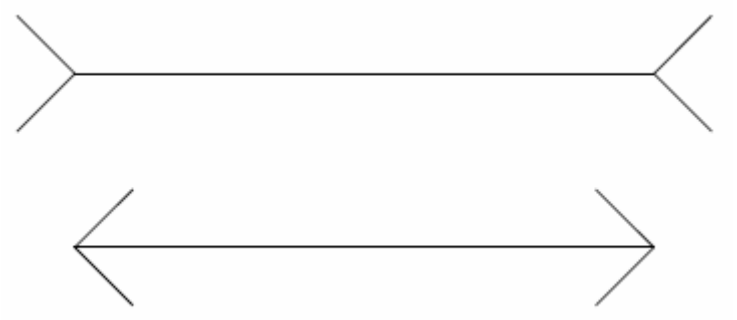

Figure 3.4: Müller-Lyer illusion
(e.g. Hartmann 1998: 111)

In this Figure, one "perceives" the upper horizontal line to be longer than the lower one, although both lines can be proved to have the same length. This poses a difficulty: We cannot simply say that someone perceiving a difference in length here has a failed perception because there is no such difference, even if individuals might (and actually seem to) be naïve realists and insist that the lines have indeed different lengths. If perceptions occur as results of making differences by actualizing somatic movement schemas, and if someone makes such a difference in the case of the lines above, then one should be justified in talking about perceiving different lengths. What is crucial here is that subjects do not exist in isolation but within praxes which are among other things constituted by interdependences of acts. It is in principle possible then to recognize illusions. Treating two different objects as being identical might be unproblematic with respect to many purposes but if it leads to a problem (a certain movement schema cannot be actualized because the two objects perceived as being identical "behave" differently throughout the actualization), then another solution is necessary. Within praxes, such solutions consist in the construction of artefacts which are instrumental with respect to the actualization of movement schemas. In particular, it is the additional criteria of differentiating (here: by constructing measurement devices) by which humans transcend subjective differentiations and make differentiations available which are intersubjectively accessible and acceptable. Of course, those additional criteria must be justified with respect to the needs and subjective experiences of the actants within praxes, i.e., the differentiations made within a community must be traceable for its members. It must be noticed, however, that this leaves room for undetected illusions.

> In sum, "illusions and perceptions can be confused because a differentiation between illusion and perception is made possible not until and only relative to a criterion of intersubjective accessibility and additional criteria explicitly agreed upon." (Hartmann 1998: 117).

Only the communicable divergence between subjectively and intersubjectively construed reality allows one to talk about what different perceptions "feel like" (cf. Ryle 1990 [1949]), since it is only this divergence which makes a distinction between "what is" and "what seems to be" necessary. The assertion that the feeling associated with perceiving the lower line being shorter than the upper one is only meaningful and necessary when it is intersubjectively sharable that they are in fact not identical in length.

3.1.2 Assumptions concerning the significance of perception for the linking competence

In this section some subordinate assumptions to (B A1) are presented concerning those aspects of perception that are considered to be significant for what I am attempting to explain – the linking competence. They shall serve as an outline of the argumentation in the subsequent sections in which each of the assumptions is discussed.

- Perception must be divided into sensation and identification/categorization (cf. Sternberg [4]2006, ch. 4, Engelkamp & Zimmer 2005, ch. 1, 2, Eysenck & Keane [5]2005, ch. 2, 3, Ward 2006, ch. 6, Bruce, Green & Georgeson [4]2003, Marr 1982). Sensation comprises the processes from the affection of our sense organs by light

waves to the recognition of a stimulus. Identification is the process by which the recognized stimulus is identified as instance of something known.

- Sensed states, processes, and activities are inherently indeterminate, or underspecified, with respect to certain relations holding between its participant objects (especially when it comes to matters like causation, purposefulness, or psychic states) (cf. Hastorf & Cantril 1954).
- Verbal expressions of perceived events impose relations on these events (holding between the participant objects). These relations are not (necessarily) present in the stimulus event (or could have been identified differently). The relations expressed in such verbal expressions cannot originate in the stimulus alone (apart from the trivial fact that perceiving/identifying/speaking requires a cognizer/speaker).

3.1.3 Sensation

Because it is failures in perception which provide the most useful insights in how perception works (cf. Ward 2006: 79), I shall make use of cases in which impairments decrease people's differentiation performances (cf. Behrmann & Nishimura 2010 for an overview on types and subtypes of agnosia[64]). I claimed above that that there are two main processes involved in perception, namely sensation and identification. Sensation can be subsumed under what is usually called bottom-up processes. This means that in sensation there are no (or hardly any) processes involved drawing from previously gained knowledge or conceptual contents. On the other hand, identification involves top-down processes in which what is sensed and recognized is "matched" to something known, i.e., to something that is present in long-term memory. Is there evidence for such a claim? It would be justified to talk of two different processes, if one could at best show that sensation and identification can be doubly dissociated.[65]

We know of many cases in which sensation is impaired. For instance, Goodale and Milner (2004) report on a woman whom they call DF. She suffered a gas accident and afterwards was no longer able to "see" the shapes of objects, i.e., their edges and outlines. What she could see was features of the surfaces of those objects, e.g., colors, textures, and grain. (This points to another dissociation within sensation.) From this we see that someone who is not able to detect the boundaries of objects will not be able to identify them as instances of something known beforehand. However, DF had completely intact identification abilities in other modalities. Even if she could not visually identify objects, giving her an apple for haptic perception did not result in any problems concerning the sensation of its shape and edges and the identification of the object as an apple. In other words, identification abilities were fully intact. Furthermore, although DF was not able to adequately draw copies of pictures of simple objects (because she did not detect their shapes), she performed very well in drawing pictures of the same objects when asked to draw them from her memory (even if she did not detect the edges of her own drawings). Thus, cases like DF's (among others, cf. Behrmann & Nishimura

[64] "Agnosia" literally means 'state of not knowing'. "Knowing" should not be taken too literally here. Actually, there is a variety of processes involved in impairments the results of which are called agnosias, not all of which can be associated with "knowledge". This should become obvious throughout the discussion.

[65] That means that one would have to show that one patient is impaired in sensation while his identification performance is spared, while another patient shows the reverse pattern (cf. Ward 2006: 82).

2010: 206f.) which are called "apperceptive agnosia" with the subtype "visual form agnosia" point to an impairment which affects only bottom-up processes of perception.[66]
Cases in which sensation is intact while identification is impaired (called associative agnosia) are also well known, showing an even greater variety in subtypes (cf. Behrmann & Nishimura 2010: 207ff.). McCarthy and Warrington (1986) report on a patient whom they call FRA. He awoke one morning and noticed that he was not able to read the newspaper any more. Psychological tests showed that he "saw" things "correctly", i.e., he recognized the form of objects, but was not able to identify them as instances of objects he knew. For instance, he was not able to judge whether *a* and *A* were the same letter and he performed poorly on word-picture matching tasks (requiring retrieving a word for the sensed stimulus from long-term memory). Other cases of failed identification due to associative agnosia show that the agnosia can be restricted to certain categories, e.g., animals and tools, living or non-living things (which points to dissociation within associative agnosia; cf. Hillis & Caramazza 1991). Successful sensation will be termed here "recognition", its result a "percept". The criterion of successful recognition is the ability of the perceiver to inform others about the features of objects (which does not imply identification of the object as an instance of something known). Importantly, not everything which hits the retina will be recognized. What is recognized is therefore convergent on what is actually sensed.

Although I have presented single cases here, the two forms of agnosia are well-known clinical pictures and clearly demonstrate that sensation and identification are separate processes.

Before we can gain a more global picture of perceptual mechanisms, a sketch of the overall processes involved in perception seems to be instrumental here (for the following cf. Bruce, Green & Georgeson [4]2003, Engelkamp & Zimmer 2006, Ward 2006). Readers already familiar with sensation might skip here to section 3.1.3.6.

3.1.3.1 The eye

Sensation is possible among other things because electromagnetic energy reflected from objects in certain wavelengths stimulates different kinds of cells making up our retina (cf. Bruce, Green & Georgeson [4]2003: 4ff.). Waves of light cross our pupils and lenses and build something like upside-down images on the retinas due to the optics of the lenses. The point where waves of light affect the retina at a zero degree angle is the fovea. This region shows the highest number of cone cells, cone cells and rod cells being the two types of photoreceptors in the retina (in fact, the retina consists of several layers of cells). Cone cells are sensitive to different wavelengths of light (contributing to colors) and are mainly involved in seeing acutely, while rod cells are sensitive mainly to differences in light intensity and they are involved in black-and white seeing, mainly during night time. The number of cone cells decreases strongly in relation to the angle degrees toward the periphery, away from the fovea. The periphery is important for the detection of motion/movement. The point on the retina where the optic nerve leaves the eye (near under the fovea) is the blind spot because there are

[66] Cf. Humphreys & Riddoch (2007). Their argument implies that the distinction between apperceptive and associative agnosia might be too simplistic. However, it does not directly bear upon the distinction I argue for.

no photoreceptors at all. It is not the case that we do not see anything at the blind spot, as one might think, because contents of the retinal image are "filled in" at this point (cf. Ramachandran 1992). For visual acuity we have to focus our sight on a stimulus so that the lens accommodates to the stimulus.
The cells in the retina can be characterized in terms of lateral inhibition. This means that a given cell's firing rate might be inhibited by neighbouring cells. So, somewhat simplified, neurons do not only transmit electric signals, they also modulate them in terms of excitation or inhibition. Lateral inhibition is especially important in detecting edges and perceiving contrast between surfaces with different light intensities. The effects of lateral inhibition can be characterized in terms of receptive fields. Receptive fields respond to differences in light rather than to light as such (cf. Barlow 1953). The mechanisms in receptive fields are one important precondition for our seeing points and figures.
A particular cell type in the retina, ganglion cells, can be shown to be specified with respect to the movement/motion of stimuli or to details of stimuli, depending on whether they fire transiently (transient-response cells) or show sustained firing (sustained response cells). The former are distributed all over the retina and can be identified with rods, while the latter can be found particularly around the fovea and are excited by cones. The two types of ganglion cells belong to the magnocellular (or M-) system and to the parvocellular (or P-) system, respectively. Most importantly, receptive fields of the kind found in the retina can also be found in the neuronal pathways leading to the brain where later processing of visual stimuli takes place.

Thus, the spatial relationship between stimuli that are projected to the retina are retained for further processing in the primary visual cortex (see below).

3.1.3.2 The lateral geniculate nucleus and the primary visual cortex
The optic nerves of both eyes meet at the optic chiasm. From there the activations stemming from the left visual fields (rightmost on the retinas) are transmitted to the left hemisphere, while those from the right visual fields (leftmost on the retinas) are transmitted to the right hemisphere. Several pathways lead away from the eye to several parts of the brain. For our purposes, namely describing important aspects of object perception, the one leading from the optic chiasm to the primary visual cortex (or V1) is especially interesting. A smaller part of optic nerves leads to the superior colliculus which is involved in the movement of the eyes and locating objects in space. The geniculostriate pathway, leaving the eye, passes the lateral geniculate nucleus (LGN) on its way to V1. As has been mentioned above, M-layers are involved in detecting motion/movement, and P-layers in details of stimuli. Damage to either M- or P-layers leads to failures in detecting motion/movement or color, texture, and grain of stimuli, respectively (cf. Schiller, Logothetis & Charles 1990). Interestingly, those neurons that are adjacent in the LGN also have adjacent receptive fields on the retina. That means that the spatial relations between receptive fields on the retina correspond to the spatial relationship of neurons in the LGN. Retinotopic relations are then preserved in the LGN, since the cells in the retina and the LGN share a similar topological organization.

The nerve fibres from the LGN lead (predominantly) to the primary visual cortex which is far more complex than the former. In V1 one can find different types of receptive fields, corresponding to simple, complex and hypercomplex cortical cells (cf. Hubel & Wiesel 1962). All these cells are sensitive not only to the positions of receptive fields on the retina but, what is equally important, to their orientation. The cells seem to be organized in columns, each being sensitive to a specific degree of orientation (with a tolerance of about 20 degrees) of the stimulus (cf. Hubel & Wiesel 1974, Hubel et al. 1978). Furthermore, the cells in V1 are not only organized relative to the positions of the receptive fields on the retina and to their orientations, but also relative to the eye they react to. These cells are also organized in columns. Columns responsible for the same retinal region and the same orientation are then twofold between left and right eye. The different cell types mentioned above react to stimuli of increasing complexity, making possible the detection of points of light, the orientation and direction of moving stimuli, specific lengths of stimuli, edges, and bars. In sum, the more complex the stimuli, the more sensitive the reaction of these cortical cells.

In addition, the cells in V1 are again retinotopically organized with respect to the retina and the LGN, and the different neuronal substrates of M- and P-cells are also preserved.

The geniculostriate pathway is sketched in Figure 3.5.

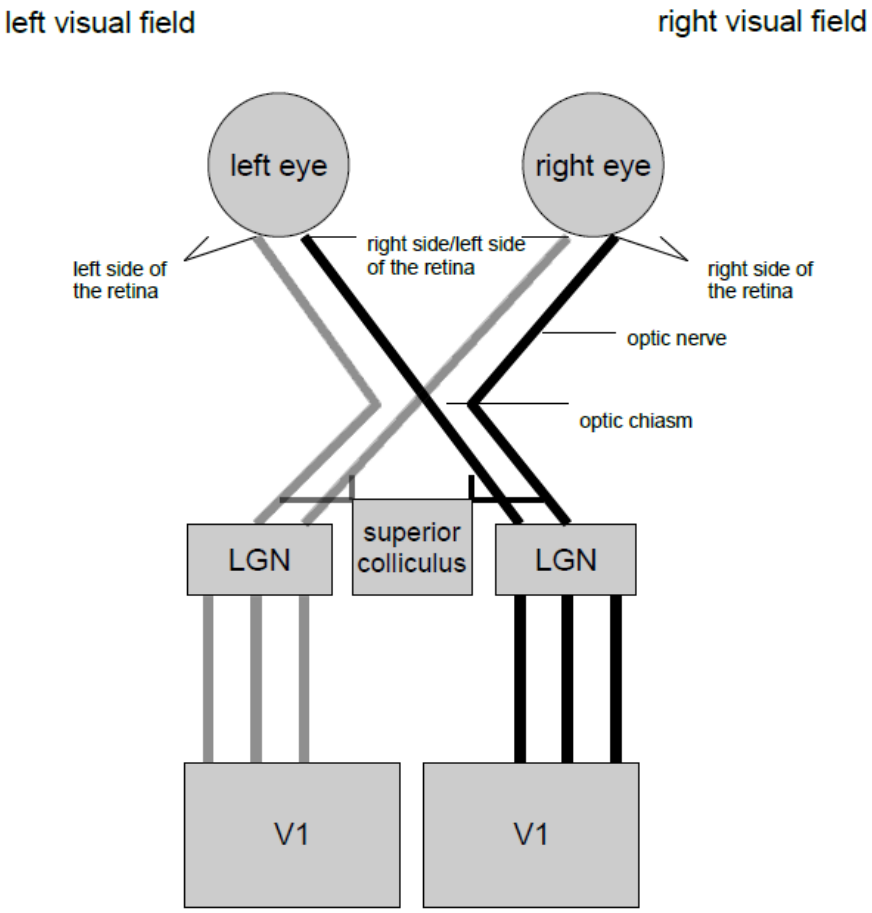

Figure 3.5: The geniculostriate pathway
LGN: lateral geniculate nucleus; V1: primary visual (striate) cortex

How can the output of V1 be characterized phenomenally? Roughly, the results of the processes described so far can be described in terms of a bundle of disintegrated features: There is something. Something is colored, something has a shape, i.e., it has edges of a specific length or is a bar of a specific length, something has a specific orientation, something moves from there to there. There might be several "somethings" which later turn out to be a single object (e.g., a book flipped open by moving only one half of it).

3.1.3.3 The integration of basic visual features

Sensation from the retina up to V1 does not constitute the entire process of sensation. For sensing objects in the way someone with associative agnosia senses objects, one mainly has to account for the integration of parts into wholes, i.e., singling out objects of specific forms and segregating them from other objects of specific forms. In these processes the same forms of knowledge are employed as in cases of occlusion. These forms of knowledge are known as gestalt laws of perception (cf. Wertheimer 1922, 1923, Palmer 2002, Bruce, Green & Georgeson [4]2003: 123ff., Peterson 2001: 177ff. for an overview). However, their status is somewhat unclear because there seem to be top-down processes involved within the P-cellular system (from the extrastriate cortex (V2) which is involved in attention; cf. Qiu & von der Heydt 2005; and possibly even from prestriate cortex areas (V4), (V3), and mediotemporal cortex (V5); cf. Grossman 1993), while gestalts might possibly remain in the realm of sensation. Gestalt laws are instrumental in grouping stimuli into parts and wholes, i.e., in making possible sensation of discriminable objects. I will first present these gestalt laws and their contribution to object perception and then present an argument for their being part of sensation, not identification.

(i) The law of proximity states that elements are more likely to belong together if they are close together. Figure 3.6 (i) shows that the vertically aligned spots tend to be grouped together because they are closer to each other than in the horizontal dimension.

(ii) The law of similarity states that those elements are more likely to belong together which share similar shapes. Figure 3.6 (ii) shows that those elements aligned vertically tend to be grouped together, although the distance of one element to another is identical in the horizontal and vertical dimensions.

(iii) The law of continuation states that elements devoid of abrupt changes are likely to belong together. Figure 3.6 (iii) shows that we tend to perceive two diagonally aligned lines, instead of the following forms: <, >, ∧, ∨.

(iv) The law of closure states that elements yielding a closed shape when "filled in" are more likely to belong together. Figure 3.6 (iv) shows that we tend to perceive an rectangle here, although there are gaps in it.

(v) The law of common fate (not depicted) states that those elements that move together also belong together. This was illustrated by the light point experiments executed by Johansson (1973). He attached light spots to the limbs of a moving person. In darkness, the moving (walking, running, dancing) light points were

perceived as someone's walking, running, and dancing, respectively. For sensation this means that they were perceived as a single object.

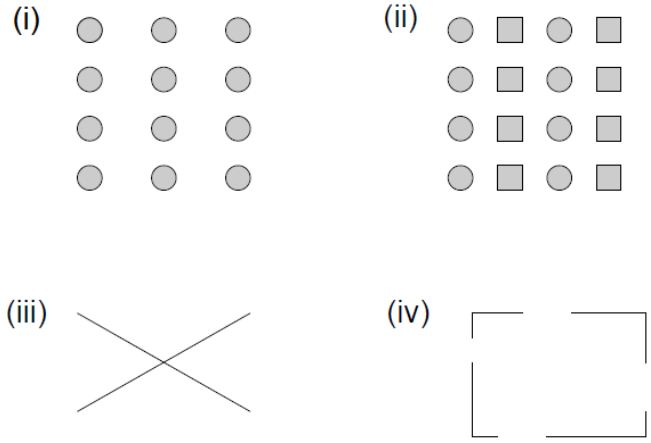

Figure 3.6: Gestalt laws
(i) Law of proximity, (ii) law of similarity,
(iii) law of good continuation, (iv) law of closure

It should now be clear that these gestalt laws contribute to the grouping together of the stationary or moving shapes, colors, edges, bars which are the result of the processes in the geniculostriate pathway. The processes of grouping together already occur outside V1 in the prestriate cortex (V2 as part of the extrastriate cortex). Proximate and similar "objects" without abrupt changes which are "closed" are grouped together, as are "objects" moving together. One clue in depth perception[67] is that a partially occluded object should be behind another object. The law of closure seems to be involved in this. In Figure 3.7 it could be that the lines in Figure 3.5 (iv) are simply partially occluded by two bars. However, the perceptual mechanism of closure makes it possible to perceive a rectangle.

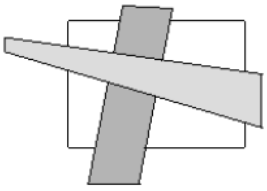

Figure 3.7: Law of closure and depth perception

[67] Actually, we face the problem that the retina is two-dimensional, while we move in a three-dimensional world. There are a number of cues for depth perception, i.e., for detecting which positions two sensed objects take in relation to each other and in relation to the viewer. The three most important cues are motion parallax, stereopsis, and the texture gradient. As to motion parallax, everyone is familiar with the phenomenon of objects nearer to the viewer appearing to move faster than those farther away when the viewer turns his/her head. This allows the viewer to determine the positions of stimuli relative to him/-herself. Stereopsis is vision with two eyes. The retinal images on our eyes are not identical but disparate when we perceive stimuli. A given stimulus projects onto many non-corresponding points on each of the two retinas, one laid over the other. This leads either to seeing something double if the points on the retinas exhibit too great disparity or to depth perception. Effects of the texture gradient can be illustrated by imagining standing in front of a field of sunflowers. The flowers in front of the viewer seem to be less densely arranged than those at the opposite side of the field. This change in the texture of the "surface" of the field leads to depth perception. Besides these cues, it is necessary for a perceiver to calculate how far the stimulus is from the perceiver using the visual angle at which light reflected from a stimulus hits the retina as well as the size of the retinal image. He/she also must "know" that something partially occluded by another object is behind this object. One question is where this "knowledge" comes from.

Taken together, the gestalt laws provide what is known as figure/ground segregation of the stimuli within the visual field in that they (1) help to "build" a figure as a whole from the basic visual features and they (2) help to determine the spatial relationship of a figure in reference to a ground, i.e., to determine how the figure relates spatially to what else is there in the visual field.

The gestalt laws thus provide the reconstruction of three-dimensional spatial relations from the two-dimensional retinal image. For this we need to "know" which edges belong to which object (i.e., the entirety of the object). Consider Figure 3.7 above again. There are many boundaries between the three objects. To determine their relative positions it is crucial to know which object "owns" which boundary, i.e., which object is occluded by which other object. This is accomplished either by bottom-up, top-down or both processes (cf. Qiu, Sugihara & von der Heydt 2007). In other words, detecting the relationships among objects in 3D space can be accomplished even in the absence of attention but can also be modulated by attentively focussing something (as a top-down process) in the visual field (as has been illustrated in section 3.1.1 by means of the Rubin face and the Necker cube).

A "good" figure is – in accordance with the gestalt laws – an integration of visual features which

(i) are proximate to each other,
(ii) are similar to each other,
(iii) constitute continuous lines,
(iv) exhibit closure,
(v) and move together.

The segregation of a figure from a ground is made possible by

(vi) the smallness of a figure relative to a ground,
(vii) the movement/motion of a figure relative to a ground.

For an illustration of (vi), imagine visiting a museum in which paintings are exhibited: We cannot single out a painting (as a potential figure) from its background (a wall in the museum) when we stand so close to it that it occupies our entire visual field. The painting is apt to be perceived as a figure only in relation to the position of the viewer relative to it. For an illustration of (vii) imagine perceiving (and monitoring) a car (figure) crossing a bridge (ground). The car consists of basic visual features moving together with well continuing lines and closed form. It moves relative to a stationary ground against which it is singled out. However, the ground need not be stationary and the figure need not move necessarily. Imagine perceiving (and focussing on) someone standing on the platform of a train station while a train is passing behind him. This would be an example of a stationary figure relative to a moving ground. In this case, however, the smallness of the figure in relation to the ground is given. Grounds may also have features that make them apt to be perceived as a figure, e.g.,

person A (the figure) standing in front of another person B (the ground)) and may therefore also be object-like. If the perceiver goes around persons A and B such that B stands before A then, it is possible to perceive person B as the figure and person A as the ground. However, grounds are mostly locations like gardens, forests, countries etc. which lack object features and under most circumstances are not able to be perceived as figures in sensation.

As an intermediate summary, the results of the processes from the retina via LGN and V1 to V2 consist in the detection of several features of stimuli, their shape (including edges and bars), and their orientation.[68] Perceived contrast (by means of very early processes of lateral inhibition and later processes of determining border-"ownership") and depth (by means of stereopsis, motion parallax and texture gradient) help us to group these basic features together in order to discriminate objects. Gestalt laws of perception further facilitate the separation of objects from one another and the determination of what is fore- and background. Figure/ground segregation may be influenced by top-down attentional processes, but does not need to be.

Many features of objects are imposed on them by the perceiver, i.e., they are not necessarily "present" in the stimulus. We "infer" that there is a rectangle behind the bars in Figure 3.7, although there need not be one. Such inferences include top-down processes which are nevertheless different from those in identification (as part of perception in addition to sensation). For instance, Humphreys and his colleagues (see Ward 2006: 115ff.) report on a patient who obviously lacks the ability to group visual features together in accordance with the gestalt laws: Their patient was able to discriminate the lengths, positions and orientations of objects but was not able to identify them as instances of something known. Experiments showed that he could not integrate parts into wholes although his sensation was intact, so that he could describe what he "saw". On the other hand, he was able to draw copies of objects, to draw pictures from memory and to identify objects by other modalities. In other words, he suffered a special form of apperceptive agnosia, namely integrative agnosia (Riddoch et al. 1987). Apperceptive agnosia affects sensation and only affects identification because of its effect on sensation (as in the case of DF). In conclusion, from the perspective of sensation and identification, the processes outlined so far belong to the former.

As we have seen, there are different kinds of cells reacting to different stimulus features. Gestalt laws help to single out figures from the visual fields (result: There is something) and to perceive them as specific forms (result: This something has this and this feature). The processes involved in integrating visual features into those complete forms which can be thought of as being the output of sensation are – apart from the importance of the gestalt laws – largely unknown (cf. Bruce, Green & Georgeson [4]2003: 57ff., Engelkamp & Zimmer 2006: 101ff.). This is why less physiological information was provided in the passages dealing with gestalt perception, i.e., those following V1 in the process of perception.

[68] Importantly and in accordance with the explanation in section 3.1.1, features are the result of differentiating. Stating that we perceive different things because there are differences in the world (cf. Rosch 1999) is thus a methodical error, because differences cannot be introduced without introducing someone making differences (cf. Hartmann 1998: 82).

We know, however, that in the prestriate cortex (V2) there are retinotopic structures similar to those in LGN and V1.

3.1.3.4 Two visual pathways

The processes occurring in the geniculostriate pathway are so complex that portraying a comprehensible diagram of them requires considerable simplification. Matters become even more complicated when it comes to V2 and the processes beyond it. For convenience of comprehension, the most important pathways of visual perception we know about are schematically depicted in Figure 3.8.

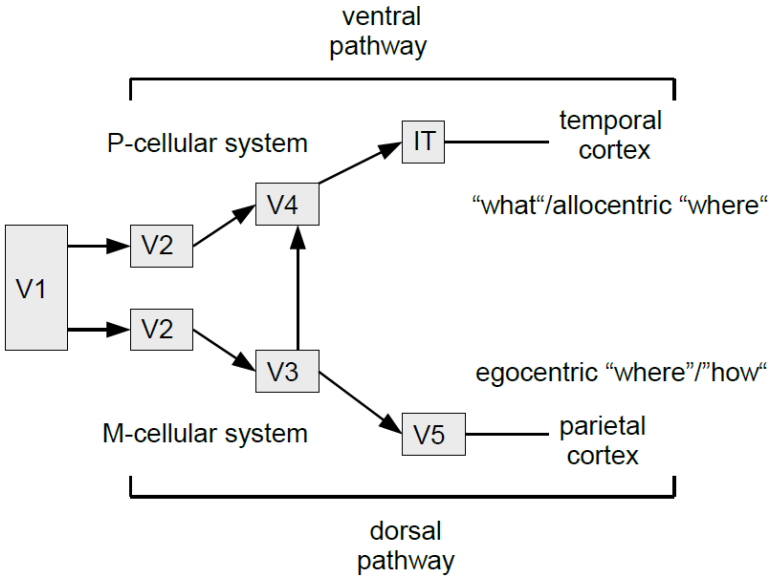

Figure 3.8: Two visual pathways
V1: primary visual (striate) cortex; V2, V3, V4: extrastriate cortex;
V5: mediotemporal cortex; IT: inferotemporal cortex

As Figure 3.8 indicates there are two different pathways leading from V2 two other cortical areas involved in perception which in turn lead to non-visual cortical areas (cf. Ungerleider & Mishkin 1982). However, the origins of the two pathways can be traced back in part to V1 (Bruce, Green & Georgeson [4]2003: 58f.). The "dorsal" pathway runs from V2 via V3 and V5 to non-visual cortical areas in the parietal lobe. The "ventral" pathway leads to the non-visual temporal lobe via V4 and inferotemporal areas (IT). Functionally, the dorsal pathway seems to be involved in the localization of objects in space and is therefore often called "where" pathway. The ventral pathway seems to be functional in the recognition of objects (not to be confused with identification. An object is recognized if it can be described to someone. For this it is not necessary for someone to identify it as an instance of something; cf. Bruce, Green & Georgeson [4]2003: 62ff. for experimental evidence for the different functions of the pathways). Ungerleider and Mishkin therefore call it the "what" pathway. Experiments in apes have shown that damage to or the absence of the parietal lobe (destination of the "where" path) leads to the apes' inability to locate an object in relation to another object. Damage to or the absence of the temporal lobe (destination of the "what" path) results in their inability to discriminate different objects (cf. Mishkin, Ungerleider & Macko 1983). Remember that a

similar clinical picture was also reported in Goodale and Milner's study of DF. With respect to humans we have seen that different cell types are sensitive to different types of stimuli. For V5 (part of the "where" path) it has been shown that great majority of its neurons are sensitive not only to the location but also to the direction of movement/motion of stimuli, while this is true only for a few neurons in V4 (part of the "what" path). At the same time, a high number of V4 neurons are sensitive to color. This is not the case for any neurons in V5 (cf. Engelkamp & Zimmer 2006: 65, but see Bruce, Green & Georgeson [4]2003: 59f.). In addition, V4 seems to be involved in detecting the position and curvature of contours in more complex shapes – part of what is required for recognizing objects.

The case of the dorsal and ventral streams is not as simple as it seems, however. Goodale and Milner (2004) ascribe both functions (locating objects and their movements relative to one another versus recognition of their form and details), to the ventral stream alone. In addition they break down the "where" functions (what Ungerleider and Mishkin ascribe to the dorsal pathway) into two separate processes. One of them is dedicated to the perception of objects in relation to one another. This is called allocentric space. Crucially, gaining an "object-centered" reference frame goes beyond the actual perceptual situation and includes top-down processes which have to be acquired in addition to a viewer-centered reference frame (cf. Bremner, Bryant & Mareschal 2006, for further evidence see Butterworth & Jarrett 1991). Allocentric space will therefore be discussed in the next section. The other one is dedicated to perceiving the relation of objects to the perceiver. It is thus called egocentric space.

In Goodale & Milner's view, the ventral stream is involved in form and detail recognition and in conceptualizing spatial relations in allocentric space. In contrast, the dorsal path is considered to be involved in perceiving (and behaving/acting from within) egocentric space.

It adds an important facet to the considerations of Ungerleider and Mishkin, that we do not merely perceive but that perception is crucial for the actualization of behavior and action schemas towards the environment. The dorsal pathway makes it possible for humans to behave and act successfully towards the objects in the environment in that it provides information about the perceiver's position relative to the objects around him. Thus, the dorsal pathway does not only provide the "where" of perception space but also the "how" of action in egocentric space. Is there evidence for such claims? Indeed, the story of DF above was only half of the truth. As has been mentioned, DF suffered an apperceptive agnosia, more precisely a visual form agnosia. Because form is associated with the ventral stream, one would assume that it was damaged. This was indeed the case. Thus it follows that, if Goodale & Milner's theory is right, DF should not be able to perceive the location of objects in allocentric space but should have no or few problems in actualizing movement schemas towards objects in her environment. This seems strange because not being able to locate something seems to imply the inability to behave or act successfully toward objects. However, DF showed exactly this pattern. In perception, she could not recognize (chance level) the angle of a slot and whether some specifically oriented card could be put into it (cf. Goodale & Milner 2004: 19ff.). In contrast, when she was asked to put the card into the slot she performed well, i.e., nearly as accurately as the control group. Further evidence comes from the finding that locating stimuli in egocentric and allocentric space can be doubly dissociated. This is the reverse pattern of

that found in DF and is called optic ataxia. It concerns the inability to actualize movement schemas towards objects on the basis of visual perception. Patients of optic ataxia with damage to regions in the posterior parietal cortex should be able to recognize objects perfectly while not being able to act toward them successfully. This is indeed a well-known impairment (cf. Perenin & Vighetto 1988).
Here, at the end of the dorsal pathway where perception and action have their "functional meeting-point" is one of the endpoints of sensation. It is not the case, however, that category-specific identification (top-down processes) due to a sociocultural praxis is necessary for actualizing some movement schema towards objects in one's environment. This is an important point: Someone who has never heard of or made experiences with a hammer need not know that a specific object is a hammer in order to act toward or with it. Furthermore, he/she does not even need to know that a hammer is used for hammering to be able to act with it in a way that is similar to hammering. This will be discussed further down in the context of affordances (see section 3.2.1.2). It shall suffice to say here that it is the form of this object which "affords to" the perceiver certain movement schemas that can be actualized toward it independently of the knowledge of the purpose for which it has been constructed, i.e., independently of the socioculturally determined functional knowledge necessary to identify it as a hammer. In contrast to a simple object like a hammer, recognizing the form of a staple gun does not suffice to "infer" from its form that one can staple together sheets of paper with it, i.e., the purpose for which it has been constructed. In order to "know" this one has to identify the staple gun as a staple gun and to get access to its function from memory.

3.1.3.5 Motion/movement perception

Since the emphasis has been laid on object perception so far, motion/movement perception shall be discussed briefly. It has been mentioned above that different systems in perception are involved in object (feature) perception and movement/motion detection. The rough correspondences are given in Table 3.1 below which complements Figure 3.8 above.

receptor cell type	retinal region	senstivity for	response type	cellular system	sensitivity for	mapping from retina to LGN	mapping from retina to V1	destination in sensation	pathway
cone	fovea	color, acuity	sustained response	parvo-cellular	object features	few to one	many to many	temporal lobe	ventral (alloc. „where"/ "what")
rod	periphery	black-white	transient response	magno-cellular	movement/ motion	many to one	many to few	parietal lobe	dorsal (egoc. „where"/ "how")

Table 3.1: Neurophysic components in object and motion perception

A discussion of motion/movement perception thus addresses the components in the lowermost line of Table 3.1, or, in terms of Figure 3.8, the dorsal pathway. Damage to V5 which is part of the dorsal pathway may lead to the inability to perceive motion. Patients of so-called akinetopsia perceive "series of still frames" (Ward 2006: 112). That means their object perception mechanisms may be preserved while motion detection fails (e.g., Schenk & Zihl

1997a, 1997b), thus pointing to a dissociation. In psychology motion/movement is often treated as change of position over time (cf. Bruce, Green & Georgeson [4]2003: 210). Most importantly, it must be added that it is the change of position of something which is recognized by a perceiver. Movement/motion is always directed, i.e., for a perceiver the position of something (a figure) changes in time relative to some background which is either stationary or changing its position through time differently from the former. What are the mechanisms involved in detecting position changes over time in some specific direction? Similar to different types of cells (simple, complex, hypercomplex) involved in detecting different features of objects, there seem to be direction-sensitive cells in the M-cellular system in V1, and detectors for more complex forms ("manners") of motion/movement (radial, circular, etc.) in V5 and neighbouring areas (cf. Anstis, Verstragen & Mather et al. 1998). It has been proposed that similar to the mechanisms involved in detecting bars and edges the receptive fields of these cells combine to allow movement/motion detection (cf. Adelson & Bergen 1985).

I have talked so far about "movement/motion perception". The reason for this is that there is evidence for a dissociation between movement and motion perception, and discussion about the question whether what distinguishes movement (above characterized as the expression of animate activity) from motion (expression of inanimate processes) involves top-down processes or can be "found in" the percept. There are reports on patients who are not able to detect motion, i.e., moving inanimate objects. At the same time they are able to identify moving dots (like those in the experiments of Johansson 1973) as so-called "biological movement", i.e., in our terms, movement of animate, in this case human, beings (e.g., Vaina et al. 2002). However, the respective literature does not differentiate between motion and movement in a way comparable to the one proposed here. Thus, the opposite of their term "biological movement" would be "non-biological movement", which, according to the view taken here, is a contradiction, since movement is the term for animate activity by definition. From here onwards I will use "movement" for "biological movement" and "motion" for "non-biological movement", in accordance to the thing-circumstance taxonomy. Perception of movement (as opposed to motion) seems to be neuronally substantiated in regions near V5 which is involved in motion detection. No or few parts of V5 itself seem to be involved in movement perception (Grossman et al. 2000), however.[69] How is this possible?

I would purport that movement perception is the result of an identification process involving top-down processes including non-conceptual knowledge (besides attentional and gestalt related processes), while this is not necessarily the case for motion detection (cf. Servos et al. 2002, Blake & Shiffrar 2007: 53f.).

In other words, motion can be recognized without identification. It is "contained" in the percept. Movement, on the other hand, must be identified as a special instance of something moving via top-down processes. What distinguishes both is thus not part of the percept. The

[69] It must be mentioned that in experiments with light points the involvement of neurophysical correlates of gestalt laws (here, the law of closure, in that light points are "closed" to an integrated object) should not be underestimated and that the reported results need not be ascribed to movement alone. Furthermore, "biological motion" and "inanimate motion" can hardly be experimentally separated due to the inherent variability of animate movement and inanimate motion, respectively.

main difficulty here lies in the definitional boundaries of the cognitive psychological term "biological movement" because, if taken seriously, the question of what it is that distinguishes "biological movement" from "non-biological movement" provokes a debate similar in complexity to that about the question of what agentivity is and where it ends. In the pioneering studies by Johansson (1973) "biological movement" applies to "combinations of several pendulum-like motions of the extremities relative to a joint", whereby the "geometric structures of body motion patterns in man and higher animals […] are determined by the construction of their skeletons." (Johansson 1973: 201). In other words, movements which lack such pendulum-likeness do not count as "biological movement" – clearly an unsatisfactory characterization if one thinks of the many dancing styles there are which do not include this feature, or of stumbling, for instance. Will they count as "non-biological movement"? I am not in the position to solve this problem but I would like to propose to align the "biological" vs. "non-biological motion" distinction with the distinction between motion, movement, action, and behavior in accordance with the thing-circumstance taxonomy from section 2.4. The idea is, then, that "biological motion" in the cognitive psychological terminology would apply to movement which constitutes a possible instance of action, whereas "non-biological motion" would apply to motion which does not constitute a possible instance of action (on the definition of action and action understanding see sec. 3.2.2).

3.1.3.6 The embodied nature of the percept

In sum, the processes from the affection of the retina by light waves reflected from stimuli in the visual field, and the subsequent processes in the LGN, in V1, and in the dorsal and ventral pathways leading to the temporal and parietal lobes provide object recognition and the recognition of objects moving in the visual field. Along these paths, different types of cells react to different kinds of stimuli, resulting firstly in the integration of features and parts into whole forms that constitute integrated, constant objects (ventral pathway), and secondly in the recognition of the direction in which something moves and its velocity. Together with depth perception and the organization of egocentric space the result of sensation is thus something like an image of the stimuli in the visual field.[70]

This image is, however, not identical to what might "really" be there because

(a) our perceptual apparatus (especially the gestalt laws and the Mach bands[71]) adds, fills in, or imposes some things which are not present in the stimuli and which might not be recognizable by other life-forms,

[70] One should note that these features are features thanks to our differentiation performance in everyday praxis which determines what features actually are. It is these differentiations which provide the psychologist the criteria for classifying neurophysical responses to stimuli as feature-sensitive (see sect. 3.1.1).

[71] This can be demonstrated with contrast. This term designates both the physical contrast (to be measured by measurement devices) and the perceived differences in light intensity on a given surface. They often do not coincide. Ernst Mach investigated that perceived contrast deviates from physical contrast. In particular, the differences in the light intensity of two neighbouring surfaces with sharp edges and different homogenous greyshade values are perceived at their edge as boosting the contrast. The brighter shade of grey is perceived to be even brighter on the edge to the darker shade of grey ("Mach bands"). This phenomenon can be explained by the mechanisms of lateral inhibition outlined earlier (cf. Ratliff & Hartline 1959).

(b) we always and necessarily have a viewer-centered perspective on the stimuli, i.e., we see less than there might be and we see something different from someone else attending to the "same" stimuli from a different vantage point,
(c) our photoreceptor cells in the retina are only sensitive to a specific and small bandwidth of wavelengths, so that we see differently from other life-forms,
(d) we recognize less than there might be in the stimuli and on the retina because the nerve impulses are regulated many-to-few, so for instance in the LGN and during other stages of processing. Often, we visually focus on what we attend to, which leads to a less detailed processing of that to which we do not attend, although it might take place in our visual fields.

What we recognize is thus not an accurate "copy" of what is in the visual field but rather a structural model (e.g., Engelkamp & Zimmer 2006: 108ff.) of the environment in the visual field which is determined by the biotic equipment of the perceiver, the stimulus features and the circumstances under which this takes place. By "structural model" I mean the fact that in the percept certain structural configurations of the projection on the retina are preserved. The "building" of a structural model (i.e., a percept in our sense) is what patient FRA (reported on above) was able to accomplish in visual perceptual tasks and what DF failed to accomplish. In the points above we encounter the basis of two meanings of "embodiment" as employed in Cognitive-Functional Linguistics (cf. Rohrer 2007). Consider the second point first: Given the assumption that the way in which we conceptualize matters depends on the way we perceive matters (cf. Lakoff & Johnson 1980; see section 3.2.1), coupled with the viewer-dependence of our perceptual encountering of the world (i.e., we cannot gain an absolute, objective perspective on it), this means that we always and necessarily have a specific vantage point in any conceivable circumstance in which we are engaged as perceiving, conceptualizing or acting beings (cf. Langacker 2000, ch. 7, ^{2}2002, ch. 12). We recognize stimuli (and to a large degree conceptualize objects and circumstances) as they are located in relation to us as viewers. In other words, they are located in egocentric space. The other three points concern a neurophysically "deeper" level, namely the evolutionary development of our nervous system which has led to the mechanisms underlying the Mach bands, the sensitivity of our photoreceptor cells to particular wavelengths, and the convergent "mappings" throughout the stages of processing. They are bound to human bodies only. One should understand "embodiment" in this sense. These human body-specific properties, as demonstrated in sensation, also show up in higher cognitive activities, since conceptualization will be shown to be identifiable as simulated perception. One important result of this section is that what we recognize is not a mirror of the external world.

3.1.4 Determinants in identification (I)

Now, the question arises what sensation does and does not provide for someone's verbal interaction. In order to interact verbally in the way illustrated in (II.1) in the introduction to part II (in which Nicole drops the milk carton and her sister Jessica says to their mother *Nicole hat die Milch runtergeworfen*), the girl Jessica has to recognize all objects in her visual field, including her mother she will be talking to, her sister, the milk carton, and the table she

will be talking about, etc. She also has to recognize all the objects moving in her visual field, especially her sister moving her arm toward and against the carton, the carton moving beyond the edge of the table, and the carton moving to the ground.

This sounds trivial, but note what, among other things, is not included in Jessica's percept of that event:

- Knowledge about how objects "behave" physically, especially in contact with other objects. For instance, the weight of the milk carton and the power of the girl are not present in the percept. They must be inferred later, as an instance of identification (and with this, attribution; Kelley 1973). That is, they must be known beforehand. Generally, it is the features of objects which restrict the range of states, processes and activities in which something can stand (cf. Kasper 2011). Many features of objects are not present in the percept. Being able to make adequate statements about what is perceived requires accessing vast repositories of prior knowledge, i.e., top-down processes.
- Causes in general, i.e., the exact relationship between objects/circumstances and other objects/circumstances in the scene (cf. Hume 1894; 1960, I; White 1989, 2009b, Cheng 1997, Schlottmann 2001: 111). A cause, or causation, is not a particular object/circumstance bringing about another object/circumstance but rather a way of talking about invariants in temporally segregated co-occurrences of discernible objects/circumstances. "What has caused what" is mostly imposed on the scene by the perceivers as instances of identification and only seldom sensed directly.
- The wider context of the scene. Has there been something in the near past (quarrel with the sister or mother) which could have tempted Jessica to do this or that, i.e., are there factors which make Jessica's imposition of some causal relationships on the stimuli in her visual field more plausible than others? Are there factors of the situation biasing the perceiver to impose particular causal relations on the scene but not others? If yes, they are not part of the percepts but part of actional knowledge due to the context (cf. Moskowitz 2005: 24ff.).
- The purposes (goals, interests) of the persons in the scene. Although putting purposes into effect consists in bringing about, maintaining, or avoiding particular circumstances which can be recognized, it is not part of the percept whether the coming about of a particular state, process, or activity was purposed or not. Rather, in the situation in question the presence or absence of purposefulness is ascribed by the speakers on the basis of identification and attribution processes.
- Stable dispositions of the persons in the scene versus factors of the situation. It need not be obvious (observable) that someone has some disposition making him/her more probable to cause misaccomplishments (e.g., illness, clumsiness etc.). Knowledge about such dispositions or about factors of the actual situation may alter the probability of certain attributions (which includes identification beforehand) (cf. Kunda [5]2002: 295ff.).

- The question whether the event in question constitutes an accomplishment or a misaccomplishment.

It turns out, then, that what we recognize is not only constrained by perspective-boundedness and the neurophysical processes and neuroanatomical makeup of the visual apparatus but that our percepts are largely underspecified with respect to the causal relations holding between the objects in our visual field and with respect to action-theoretic considerations, i.e., context, purposes, and dispositions. In other words, in making utterances in response to perceived states, processes, and activities (like the one by Jessica) we impose the respective specifications onto these states, processes and activities (cf. Jonas, Stroebe & Hewstone [5]2007: 120). In uttering *Nicole hat die Milch runtergeworfen* Jessica makes judgments involving all the above specifications with respect to which the percept is underspecified, namely the physical behavior of objects (it was Nicole's activity which sufficed to make the milk carton move and fall), causal relations (it was only because of Nicole's activity that the milk carton moved), contextual factors (Jessica might have been biased to impose certain relations on the sensed event in favour of others), action-theoretic considerations (Jessica makes her sister the subject of the utterance, chooses an agentive verb and a corresponding auxiliary, thus imposing a structure on the event which suggests that Nicole acted purposefully, leaving open the possibility of blaming here), personal or situational factors (in making Nicole the causer of the event Jessica suggests that it was the disposition of her sister and not factors in the situation which made her drop the milk. This provides the opportunity to blame her. In contrast, situations cannot be blamed). Were the relevant parameters of the above factors set differently, different specifications might probably have been imposed on the percept and a different verbalization would have been the result. This would be given, for instance, for the mother's contribution in (II.1) (*Nein, sie ist ihr runtergefallen*. 'No, (it happened to her that) it fell down.').

The crucial point about all this is that Jessica need not even be aware of or know about what she imposed on what she perceived. She rather acts and behaves as if there was only one way to grasp the perceived event and that she did so adequately. Therefore, she implicitly holds the view that what she saw was in no way underspecified but that the percept included all the information necessary to make her judgment as expressed in (II.1). This view, according to which everything that is necessary for making judgments about something perceived is (in) the percept itself, will be termed naïve realism here. According to social psychologists we are naïve realists most of the time.[72] As Moskowitz (2005: 22) puts it,

> "[t]his term captures the idea that when trying to make sense of the world, we begin with the perception of the people and objects that enter our visual field. Both objects and people have features that are independent of us. They existed prior to coming into our life space and will continue to exist once they have departed. This enduring character of the people and things we observe gives rise to the belief that our experience of things is one of an objective reality opening itself up to us."

[72] It is possible, however, to learn to be aware of at least some of the factors which bias our judgmental processes. One problem is that this sort of awareness is cognitively very effortful. Another problem is that presumably a non-manageable number of (top-down) cognitive activities are either automatized (in case of behavior) or routinized (in case of action) such that they are impossible or difficult to control, respectively (cf. Moskowitz 2005, ch. 12).

Importantly, every utterance makes some judgment, be it that something happened here in *What happened here?* or what happened in *Nicole hat die Milch runtergeworfen*. Being naïve realists means that we are not aware of the degree to which those judgments we make about states, processes, and activities by making utterances about them are constructive, i.e., they indeed depend partially on what we perceive but also significantly on what is imposed on our percepts by us in a top-down manner. One aim of this book is to shed light on the connection between particular linguistic^{o} forms and judgmental processes and activities.

To sum up, between recognition and utterance numerous identification, conceptualization, and attribution activities have to take place. The way we single out objects and their features from the visual field and recognize their direction of motion is only the raw material on the basis of which these extensive top-down activities take place.

It is not until these activities take place that stimuli gain some significance for the perceiver (as parts of their plans, threats, desired objects etc.). To recapitulate, the factors underlying the linking competence are being explored here. As the model underlying the proposed research programme suggests (especially the "data" level, see sections 2.2.3 and 2.2.4), studying parts of speech alone does not suffice to explain them. What needs to be taken into consideration is also interactional variables which have been identified as involving individual factors, contextual factors, and factors concerning the circumstances under which a verbal interaction takes place. They are important determining factors with regard to how states, processes, and activities are assessed, or judged, by speakers, and ignoring them means depriving people's linking competence of its constitutive parts, namely perceptual and interactional competences. We can now equate the interactional variables in the research programmatic model mentioned in chapter 2 with the factors above, i.e., those with respect to which the percept is underspecified, and the specification of which requires extensive top-down processes. In other words, understanding the linking competence, i.e., how people relate form and semantic contents "by" or "in" interacting verbally, can only be expediently accomplished by taking into account the cognitive activities underlying the content side of the linguistic^{o} sign – which is the reason for discussing perception and action here.
Before we next turn to identification (as one aspect of top-down conceptual processes) one of the factors shall be characterized which bias it, i.e., which contribute to the way in which something recognized is identified. This factor is salience, a property of the stimulus. Because salience is close to bottom-up processes, it is discussed in this section. The other biases which rather involve the influence of existing knowledge on identification (and conceptualization) are presented in the sections on conceptualization (3.2 and subsequent).

3.1.4.1 Salience and the power of the stimulus

I will characterize "salience" here as those features of objects in the visual field, either stable or momentary, which are rendered more prominent in relation to a perceiver than other features and which therefore are more likely to be attended to by the perceiver.

By “features” I mean those recognized throughout sensation, e.g., colors, shapes, forms, sizes, orientations, and (manners of) motion. Salience is therefore a function of both the stimuli and the perceiver. Without a perceiver, the term “salience” is meaningless. By “prominence” I mean the effect of features on the perceiver’s attention. If a stimulus is prominent enough, the perceiver will most likely attend to it. There seems to be a high correlation between salience and eye fixation and eye fixation and attention (Parkhurst, Law & Niebur 2002). That means we tend to direct our visual focus (foveal seeing) to salient stimuli because they grab our attention and force us to identify them. Thus, the most prominent features are those which are most “attention-grabbing” (Moskowitz 2005: 52).

The cause of why we attend to salient features is presumably that they trigger reactions which may be life-sustaining (cf. Duckworth et al. 2002). For instance, eluding a stone – as a reflex – flying in our direction, thereby entering our visual field and threatening our well-being is stimulus-driven in terms of salience (see section 3.2.1.1 on stimulus- and purpose-driven identification). Purpose-driven action under these circumstances (which includes extensive top-down processes, e.g., action planning) would be too slow. But not only avoidance reactions can be stimulus-driven, as it seems, but also approach reactions (cf. ibid.).

Another question is what makes stimuli salient, i.e., more prominent or attention-grabbing. Firstly, what is salient depends on the anatomical and neurophysical makeup of the perceiver (due to embodiment). For an organism only able to see black and white something green in a blue environment will presumably not be as salient as it is to us. Secondly, the features making stimuli salient seem to be closely related to the features which make a stimulus a good figure (cf. Parkhurst, Law & Niebur 2002). It is “intense, changing, complex, novel, and unit-forming stimuli” (McArthur 1981: 202) which grab our attention. It is important to note that something is a good figure only if it exhibits these features relative to a ground which does not have the same features. Only under these conditions do intense (relative to less intense; law of similarity), moving (relative to stationary; law of common fate), complex (relative to simple; laws of good continuation, proximity, and closure), and unit-forming (all gestalt laws) stimuli “pop out” from the environment. “Novel” stimuli stand out from this list in one respect. Novelty has a temporal aspect which the other features lack. When repeatedly presenting a specific stimulus to a person (where the response to the stimulus is habituated) and then presenting him/her a novel stimulus (one which differs in features from the former) where he/she expects continuation of the former stimulus, causes him/her to attend (to be measured, for instance, by fixation time) to the novel stimulus (e.g., Zink et al. 2003, Cohen, Gelber & Lazar 1971 with infants). In a sense, we find here a figure/ground segregation extending to the temporal domain, where the frequently presented (or: familiar) stimulus constitutes the ground against which the novel (unfamiliar) stimulus is identified (see also McArthur & Ginsburg 1981).

An especially important feature making stimuli salient seems to be unexpectedness which bears some relation to novelty. Because of the embedment of human perception in everyday routines and action dependences, this will be discussed in the section on the power of the perceiver dealing with pertinence (cf. section 3.2.1.1).

Naturally, salience, i.e., the featural prominence of stimuli relative to a perceiver, does not dispel any of the underspecifications mentioned in the previous section. How could it, given

the fact that salience is part of the percept and that it is the percept which is underspecified? Instead, salient stimuli affect identification in another sense: Because of the importance of salient stimuli to us, i.e., their potential value/threat, they force us to identify them. As such, what is salient is most likely to be processed further. Thus, during the judgment of a state, process, or activity we take stimuli in consideration that were salient in perception, and only salient stimuli are then accessed to impose causal relations on a percept. In other words, the salient features in the percept determine the range of potential causes and effects to be imposed on a process or activity. The perceiver seeks causes for changes, or motion/movement, in the stimuli available to him/her (cf. Moskowitz 2005: 57f.). Stimuli not attended to and therefore not necessarily identified could then be excluded from the perceiver's causal judgments with regard to what he/she has recognized.[73] It is not impossible, however, that another perceiver's perspective on the same processes/activities provides him/her information leading to his/her attributing different causal relations (e.g., Taylor & Fiske 1975). Once more it is different senses of "embodiment" which account for the subjective nature of causal attributions; firstly, in the sense of the perspectival bondage of the perceiver who recognizes and identifies not all facets of a state, process, or activity, and secondly the properties of his/her perceptual apparatus which constrain what he/she is generally able to perceive.

3.2 Identification and conceptualization: actional notions and their grounding

- In the following sections I will show that identification, or categorization, is the process by which the recognized stimulus is identified as an instance of something known. This is accomplished by matching the percept with a memorized concept. The criterion for a successful identification of something as something is that it can be shared with others as something. Identification will be shown to be either stimulus-driven or purpose-driven.

[73] If a perceiver comes to the conclusion that an event in his/her visual field must have been caused by something not present in the visual field, then he/she must seek for the cause in his/her environment or infer the cause on the basis of his knowledge about what can cause what. For instance, we all know that a snowball entering our visual field and hitting us has a cause, most probably a human one, although it might not be present in our visual field.

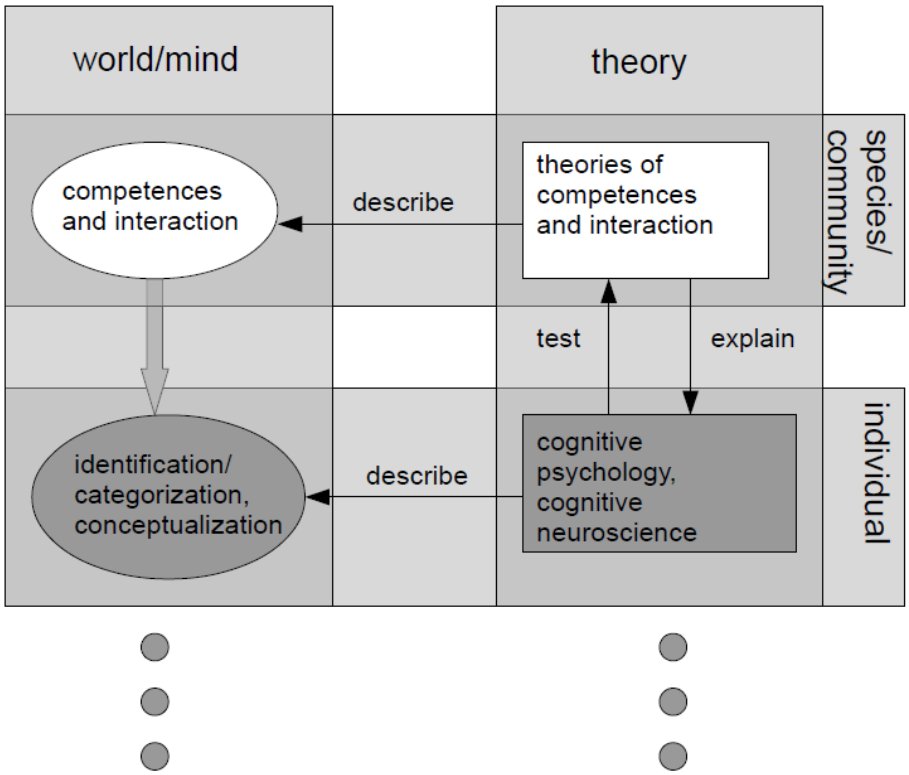

Figure 3.9: Identification/categorization and conceptualization as sub-competences of the linking competences that are developed throughout section 3.2.1

> Furthermore, the idea will be developed that conceptualization is simulated perception. In particular, one can distinguish identification, which is the step in perception following the recognition of a stimulus, from conceptualization which emphasizes the embedment of conceptual processes in practical concerns, i.e., action. This is indicated in the partial model given in Figure 3.9.

What we identify and how we identify/categorize stimuli depends on properties of the stimuli, properties of the perceiver, and properties of the situation (cf. Bruner 1957, Moskowitz 2005: 24ff.). The same is true for conceptualization except for the absence of stimuli (due to the nature of a simulation).

3.2.1 Identification in perception and conceptualization for action

In order to successfully identify, or categorize, a recognized object, we must be able to inform others about what it is an instance of. We may do this by giving its name or by illustrating what its function is by acting towards it, or by other means. In any case we have to use memorized information to identify something as something (cf. Engelkamp & Zimmer 2006: 108).[74] Patient FRA (reported on above) fails in the task of informing others about what the objects are he recognizes. He is therefore not able to identify visually recognized objects as is

[74] I consider "to identify sth. as sth. already known" to be a paraphrase of "to categorize sth.". In the following they are used nearly synonymously, whereby "categorize" renders the result more prominent than "identify" which puts emphasis on the activity.

generally the case in associative agnosia. Many psychologists dealing with identification describe this activity as the "matching" of the percept which is the result of sensation with another structural model which is stored in long-term memory (e.g., Rosch 1999, Smith & Medin 1981). It is difficult to assess the status of "matching" and "structural model" in long-term memory with respect to lifeworld differentiations. Both terms need to be grounded to be intersubjectively accessible. Now, only in cases where this "matching" fails does it become a matter for us in everyday praxis. If nothing is wrong with our perceptual abilities, these matching activities are not accessible to us, i.e., they occur without our being aware of them. It will again be those cases in which certain movement schemas cannot be actualized that give us clues as to how to conceive of these activities. We have distinguished sensation and identification by means of illustrating how they can be (doubly) dissociated as observable in patients' failures to actualize specific movement schemas.

Accomplished matching can then be described as the step linking the accomplished recognition of an object (its form can be described to someone) and the accomplishment of the identification of an object (its being-an-instance-of something can be communicated).

From here I will call those structural models considered to be present in long-term memory concepts. The activities the results of which are (mostly complex) concepts will be called conceptualizations. Conceptualization will be used as a theoretical term here. It is to be distinguished from our everyday use of "conceive of sth." which will be used here in a theory-neutral way. Now, how can concepts be characterized in relation to percepts?

On the physical level, it is naturally neuronal activity which instantiates sensation (as we have seen) as well as identification. Throughout the foregoing section it has been shown that during the processing stages in sensation there is preservation of retinotopic relations, even in later stages. Percepts thus can be conceived of as "quasi-pictorial" in that they preserve (formally transduced) features of stimuli as they hit the retina. In some famous experiments in which participants should, on the basis of some visually presented target items, judge whether some visually presented stimuli (skews, reversals or mirror-images of the target item) were instances of the target item types or not, Shepard and Metzler (1971: 701) have shown that "[t]he time required to recognize that two perspective drawings portray objects of the same three-dimensional shape is found to be […] a linearly increasing function of the angular difference in the portrayed orientations of the two objects […]." They concluded that their participants must have "mentally rotated" their percepts in order to be able to identify them as instances or non-instances of the target items. Most interestingly, Muthukumaraswamy, Johnson & Hamm (2003) found that participants' brain activities during such rotation tasks increased in those parietal regions of the brain which are also involved in defining the egocentric "where" and "how" of the stimuli in sensation. It seems even possible that a rotation task is a simulation of a rotation act executed with the hands (cf. Vingerhoets et al. 2002). In a task designed to modify "what" features of the stimuli – their size – temporal regions showed increased activity (see also Alivisatos & Petrides 1996).

Importantly, behavioral data like those of Shepard and Metzler do not only point to mental rotation of recognized objects (in working memory) but also to that of concepts, i.e., structural models retrieved from long-term memory and being independent of the actual presence of

stimuli. That means participants can "evoke" (or recall) concepts of objects not present in the perceptual field and manipulate their spatial (rotate them) or inherent features (e.g., Farah 1989, Kosslyn & Thompson 2003, Kosslyn, Ganis & Thompson 2001, Borst & Kosslyn 2008, Ganis, Thompson & Kosslyn 2004). In addition, the neuronal substrates of this "visual imagery" in the absence of stimuli (thus involving top-down processes) "reach down" to V1 and extend to those cortical regions which have been shown to exhibit retinotopic mappings (cf. Kosslyn et al. 1993). A consequence of this would be that people suffering cortical blindness from accidents should under certain circumstances preserve their ability for visual imagery, i.e., evoking quasi-images in the absence of the corresponding stimuli. If concepts in the sense used here, i.e., image-like structural models in long-term memory, are dependent on foregoing visual perceptual experiences (in contrast to being inborn), such patients should be able to "draw" from past visual perceptual experience in order to imagine specific objects and to describe them. This is exactly what Goldenberg, Müllbacher & Nowak (1995) found in her patient – a dissociation between mentally modifying a recognized object on the basis of having perceived it (as in the experiments of Shepard and Metzler) and mentally modifying a memorized concept independently of perception. That this is possible only under certain circumstances follows from the fact that mentally modifying percepts and concepts draws from neuronal substrates which do not entirely overlap, such that both abilities might but need not be damaged due to deterioration of the respective cortical regions (cf. Bartolomeo 2002). Similar to visual imagery, retrieving knowledge relating to tactile, gustatory, and auditory experiences (in the absence of the respective stimuli) activates the same cortical regions that are also active when actually processing the respective stimuli in the respective modalities (cf. Goldberg, Perfetti & Schneider 2006).

We can now draw the line between concepts and percepts more properly by stating that conceptualization is simulated perception (cf. Hartmann 1998: 146ff., Barsalou 1999, Johnson-Laird 1980).[75]

As the aforementioned experimental results indicate, this simulation even reaches down to the neuronal level (cf. Damasio 1989). In addition, in mental rotation tasks those regions of the brain (premotor cortex) may be active which would be necessary to actually perform the rotation of the objects (cf. Vingerhoets et al. 2000). Furthermore, (without putting forward a too bold interpretation,) there seems to be a type of neurons ("mirror neurons") in the human premotor cortex firing when one observes someone performing a purposeful act and when one performs this act himself (cf. Gallese & Goldman 1998, Rizzolatti & Craighero 2004, Fabbri-Destro & Rizzolatti 2008). Similarly, Hauk, Johnsrude & Pulvermüller (2004) found that reading action words activate regions which are also active during actually performing these actions. For instance, Schnitzler and colleagues (1997) also found activity in the primary motor cortex during so-called "motor imagery", i.e., imagining performing specific movements.

[75] This characterization seems to be valid for the other modalities, too (Barsalou et al. 2003, Barsalou 2005a: 406ff. reporting on the respective studies).

Therefore, the above definition of conceptualization shall be extended by stating that conceptualization can also be simulated activity.

The definition has several implications. First, simulating a movement schema is not identical to actualizing this movement schema. Thus, perceiving and acting are not identical to conceptualizing. What conceptualization misses are clearly the stimuli involved in perception and action, respectively. Indeed, brain regions underlying conceptualization and perception do not entirely overlap but perception involves brain activities beyond those also active during conceptualization (cf. Martin 2007: 31ff.). Strictly speaking, "mental imagery", "mental rotation", "quasi-images" and the like are misleading in this respect. It is always something which is rotated, something which is depicted, and someone who actualizes a movement schema.

Second, the simulation is methodically as well as ontogenetically "later" than what is simulated. Visual perceptual experiences are a necessary precondition for being able to conceptualize something in terms of visual imagery. This can be shown with the help of people suffering congenital blindness. These exhibit "visual" imagery only to the degree to which their contents are acquirable through cross-modal perception, especially haptic perception (cf. Arditi, Holtzman & Kosslyn 1988, Lederman & Klatzky 2009).[76] We find here one of the origins of the idea of Cognitive-Functional Linguistics (C4 of CFL A1) that "meanings are (at least in part) perceptually grounded" where the meaning of "meaning" relates to conceptual contents plus the modes of conceptualization ("construal"; cf. Langacker 2008a: 43). Thus, for CFL which identifies conceptualization with meaning, the fact that conceptualization is dependent on perception means that meaning depends (indirectly) on perception.

Third, an eminently important aspect of conceptualization is creativity. That means conceptualization can be uncoupled from actual perceptual/actional experiences. We have seen in the section on sensation that different neuronal substrates are involved in the processing of different features of stimuli and that retinotopic relations are preserved in the course of processing.

In cases of conceptualization (which is *per se* stimulus-independent) we are able to conceptualize counterfactual states, processes, or activities we have never visually experienced before but which are nevertheless made of the constituents of prior visual perceptual experiences (cf. Fauconnier & Turner 1994, 1998, 2002).

According to Hartmann (1998: 163; my translation), "being able to conceptualize serves the purpose of achieving the advantageous effects of specific perceptions on our action, behavior, and condition, if these perceptions cannot yet, not presently, or not at all be achieved."

The presentation of conceptualization as simulation (or "re-enactment") shall be concluded with a statement of Barsalou (2005a). According to him, perceiving things (i.e., "bottom-up

[76] It is an open question as to how to determine the degree to which other modalities might compensate for the absence of visual perception with respect to their ability of "visual" imagery (cf. Bértolo 2005, Mandler 2010: 26).

sensory stimulation") is accompanied/constituted by activity of the neurons sensitive to specific features of these things (i.e., "conjunctive neurons"; see also above). These

> "conjunctive neurons can later reactivate the pattern in the absence of bottom-up sensory stimulation. While remembering a perceived object, for example, conjunctive neurons reenact the sensorimotor states that were active while encoding it. Similarly, when representing a concept, conjunctive neurons reenact the sensorimotor states characteristic of its instances. A given reenactment is never complete, and biases may enter into its reactivation, but at least some semblance of the original state is partially activated." (Barsalou 2005a: 399)

We will later return to the consequences of the incompleteness and biases in what Barsalou calls re-enactment. For now, we can turn to the question of how matching between percepts and concepts should be conceived of. One fundamental problem in the identification of recognized objects is that a recognized stimulus must be comparable to the concept in long-term memory (cf. Barsalou 1999, Barsalou et al. 2003). In other words, to identify a recognized object *o* as an instance of an already known concept O they must be somehow similar. We know this difficulty from our everyday experiences. What we perceive has been shown to be always viewer-dependent, i.e., we perceive objects always from our vantage point and from no other (i.e., our "ego-center" differs from those of others). However, we are mostly able to identify objects as belonging to a particular category albeit our perspective on it might be disadvantageous, for instance when seeing a dog directly from above (cf. Engelkamp & Zimmer 2006: 103ff.). We might be able to identify it as belonging to the category DOG, but we might fail stating to which breed it belongs. For this to accomplish it might be necessary to see it from another perspective, one that provides more information (cf. Solso 2005: 106ff.). As several experiments have shown, there might be something like a canonical perspective which is most informative for a perceiver with respect to an identification task, since it provides most information about the features of the object in question, given the perceiver's omnipresent perspective limitations (e.g., Blanz, Tarr & Bülthoff 1999). A concept which potentially matches a percept must be similar to it or be made similar to it. In neuronal terms, the percept and the concept must share a subset of neurons (cf. Barsalou 1999). Now, concepts might be present in long-term memory (presumably not exclusively) in terms of canonical perspectives. Imagine we approach the dog we have previously perceived from above from left behind. Although this might not yet be the canonical perspective we might nevertheless be able to identify it as a Golden Retriever. Therefore we must have been able to match our percept of the dog with our concept of DOG (or even of GOLDEN RETRIEVER) in which we view it from the canonical perspective. Let us assume that the canonical perspective is one from a 45 degree angle above, to the left and in front of the dog, so that we grasp about three quarters of the object (cf. Palmer, Rosch & Chase 1981). Then the structural model and the concept do not yet fit because they actually exhibit different features (i.e., the neuronal activity underlying the percept does not sufficiently overlap with those neuronal patterns underlying the concept DOG/GOLDEN RETRIEVER). In other words, the canonical perspective alone does not supply the means by which the matching could be accomplished. Now imagine standing in front of a Golden Retriever which stands on a turning platform turning it slowly around in 360 degrees. What we do in this imagination task is to rotate this dog conceptually, perhaps along its principal axis (cf. Marr & Nishihara 1978, Marr 1982: 302ff.) the finding of which seems a necessary

condition for mental rotation. If the axis is not found because of deterioration of regions of the parietal cortex, mental rotation fails (cf. Harris, Harris & Caine 2001). It seems plausible to assume that in the course of mental rotation different feature assemblies of an object (concept) are "highlighted" in sequence, accompanied by activity of the respective feature-sensitive neurons. Now, both canonical perspectives and mental rotation seem to be involved in identifying a recognized object as an instance of something known, i.e., in matching a percept with a concept (cf. Tarr & Pinker 1989). It is at least possible that our concept of a Golden Retriever consists of multiple perspectives on it combined with our ability to mentally rotate it around a specific axis (cf. Lawson 1999).[77] Any perspective on the object, or any position of the object, is constituted by a single pattern of neuronal activity, then. However, in a non-perceptual task, when we have to retrieve the concept of an object from memory, we are likely to imagine it from the canonical perspective (cf. Palmer, Rosch & Chase 1981). It is difficult to decide whether it is the percept that is rotated to a canonical perspective in a visual perceptual experience (this might be possible by means of its formal integrity caused by filling-in mechanisms of gestalt laws) or whether it is the concept. For the former to occur it is necessary to go beyond a viewer-dependent perspective on the object and to gain an object-centred perspective on it ("view normalization").[78] For the latter to occur it is necessary to have rich former experiences with instances of the category (say DOG) to acquire multiple conceptual perspectives on it and to be able to rotate it. Discussion about this matter is still going on (cf. Peissig & Tarr 2007, Bruce, Green & Georgeson [4]2003: 287ff.). I will assume here that it is mainly concepts which are rotated in matching percepts and concepts, the success of which depends on the richness of former experiences of instances of the category. You might have accomplished such a conceptual rotation in participating in the task above with the Golden Retriever on the turning platform. Your success in this task should depend on your former experiences with Golden Retrievers. If you have never seen an exemplar will presumably either have replaced it by another exemplar of the category DOG or RETRIEVER with which you are more familiar. One who has already encountered Golden Retrievers – though not often enough to be able to visualize it from multiple perspectives – will succeed less well in rotating it conceptually. Taken together, identification should be faster, if the percept matches a category with the instances of which the perceiver is familiar due to rich prior experience with them (cf. Boer 1991), so that multiple perspectives are available to him/her and changing the perspective requires less time. This view of conceptualization could be termed "usage-based" because its functioning crucially depends on frequent perception of similar exemplars which has lead to entrenched concepts.[79] Rich, entrenched concepts (i.e.,

[77] Criticism of the "multiple perspectives" view has aimed at the implausibly high number of stored "representations" necessary for a single concept (e.g., Peterson 2001: 187). This may not necessarily be so, if one assumed that both percepts and concepts can be rotated to the degrees to which the viewer-dependent sensation and the previous experiences with the concept in question allow, respectively, and that "matching" can be accomplished by approximating percepts and concepts to compatible perspectives by rotating both.

[78] The terms "object-centred" or "viewer-independent" appear highly problematic to me. Both potentially imply that an objective perspective is possible. This is of course not the case. Rather, what is meant is a perspective that is independent from the present position of the viewer but nevertheless simulates a position of a viewer. Gaining an "object-centred" perspective includes then the ability to take a different perspective on something than the present one.

[79] This does not preclude the possibility that also percepts can be rotated, since good performance in mental rotation tasks is also possible in patients with associative agnosia. Presumably, such performance involves extensive use of gestalt laws of perception by means of completing the recognized (but necessarily incomplete

they consist of multiple perspectives and are easily activated) allow matching them with percepts, in that the neuronal activities underlying both increasingly overlap by rotating the concept into a position in which it is featurally sufficiently similar to the percept (see Langacker 2000: 93ff. on entrenchment).
In this section, the basic mechanisms of identification/categorization have been presented irrespective of the remaining biases involved. The next step is therefore to discuss the bias originating in the perceiver.

3.2.1.1 Determinants in identification (II): pertinence and the power of the perceiver

I have characterized identification/categorization and conceptualization in the last section. Identification involves the matching of a percept with a concept, whereas conceptualization is simulated perception in the absence of the respective stimuli. We now turn to the questions of how identification and conceptualization can be classified with respect to the thing-circumstance taxonomy and which of all stimuli present in the visual field are identified. Concerning the former question, identification comes along as either action or behavior. Trivially, we will not encounter counterfactual states, processes, or activities in perception (illusions excluded; see above). Thus, a creative aspect of identification does not play a significant role here. It is extremely difficult to determine whether there is some connection between identification and behavior on the one hand, and conceptualization and action on the other. The difficulty lies in the fact that our knowledge about which of all recognized stimuli in the visual field are also identified, and under what contextual, situational, and dispositional conditions, rests on experimental data, if anything. The designs of these experiments rest on instructions to participants which prescribe them a purpose. The means to put this purpose into effect are also prescribed (certain acts or sequences of acts). In the following, I will attempt to show why this is crucial. In our everyday interplay with our environment we are mostly not instructed by others and it seems problematic to treat natural situations similar to lab situations with respect to the question of how identification processes should be conceived of in either. In our everyday interplay and interaction with our environment we act purpose-rationally towards reaching goals and safeguarding interests. To put into effect our superior purposes we mostly have to actualize numerous (ancillary) action schemas first and to put their numerous subordinate purposes into effect prior to them. Let us say such an action chain was constituted by my goal to have a coffee. I have to get out of my chair, leave my desk, walk into the kitchen of my institute, prepare the coffee machine, get my cup, and so on. Before actualizing the first action schema of the whole sequence I already expect (and mentally visualize) to encounter several objects and to be engaged or involved in several circumstances throughout the entire sequence. In other words, identification as part of perception is prospective (cf. Bertenthal 1996: 438ff.) in this case:

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because of perspective-dependence) forms in working memory (cf. Cohen et al. 1996: 97) because retrieving concepts from long-term memory for completion is not available.

What is to be identified is already primed by my conceptualization of the action chain. My purposes determine the objects to attend to because they are pertinent with respect to realizing these purposes (cf. Schütz/Luckmann 2003: 286ff.).[80]

I have to attend to all the objects which are instrumental in getting coffee and I have to act toward them in the way they are constructed to be acted towards, and therefore I have to know their functions. In other words, many but in no way all objects I interplay with in the action chain of making coffee must not only be recognized, they must also be identified. My purposes determine what to attend to and therefore what to identify. Stimuli irrelevant to the putting into effect of my purposes need not be attended to and might remain unidentified because they are neither salient nor pertinent, while still being sensed (or even recognized) because they are in my visual field (for instance, the flowerpot on the windowsill, the doors to the other offices, etc.). However, getting the coffee need not be that easy. It could be that several unexpected objects come into my visual field occasionally: a colleague leaving her office space, a door slammed, a spigot leaking, etc. These "objects" are salient in that they are moving through the visual field when I do not expect them because I have not conceptualized them as part of my plans, so they redirect my attention from my current (subordinate) goal towards them and hinder the actualization of my next (ancillary) action schema. Because of this they might become pertinent to me, since they pose a problem for me, so they force me to identify them. They have to be identified for me to be able to plan my next acts, and because action planning requires top-down conceptualization of what I am to do. Such unexpected encounters happen to us and because they are unexpected but nevertheless important, the involved objects are not only recognized but also identified, because it might turn out that they provoke some action of ours.

Identification of recognized objects then turns out to be dependent on the contingencies of everyday circumstances and comes along as either purpose-driven or stimulus-driven. These are the two attentional systems proposed by Corbetta and Shulman (2002), based on neurophysiological evidence.[81] Then, identification comes along either as accomplishment resulting from action (pertinence) or as happening, maybe interfering with present purposes (salience).[82]

[80] Schütz/Luckmann use the term "relevance" which I have substituted for "pertinence" here because of the manifold occupation of the term "relevance" in theories of mind.

[81] In patients of unilateral neglect (which ignore visual stimuli on the opposite side to the damaged hemisphere) there is a tendency for preserved attention to "goal-driven" stimuli (the term of Corbetta and Shulman), while attention to unexpected stimuli in the neglected visual field fails which points to dissociation (cf. Corbetta & Shulman 2002: 213).

[82] This does not mean that salient stimuli necessarily interfere with present purposes. I take the position that the "default" case in everyday praxis is a person pursuing goals and interests. Only if the non-default case is given – one's mind running idle, for example – then salient stimuli might force us to identify them while they do not interfere with present purposes in such situations.
The identification activities which are anticipated because they are part of action plans correspond closely to what Zacks et al. (2007) call "perceptual predictions". The view presented here of how people segment and identify what is going on around them shares many (though not all) assumptions with the "event segmentation theory" proposed by Zacks & Tversky (2001) and Zacks et al. (2007) (see also Zacks & Swallow 2007 for a brief presentation of their main ideas). In section 3.4 of the present work the topic is discussed with respect to the temporal organization of states, activities, and processes, and its consequences for the linking problem.

In the former case the stimuli to be identified are pertinent, as determined by our (previously conceptualized) goals and interests; in the latter case, we are forced to identify unexpected stimuli on the basis of their salience in our visual fields, independent of or interfering with top-down processes relating to purpose-driven action chains.

We have seen that there are several stages in perception in which – from a neurological perspective – many-to-few mappings take place. It is often argued that these mappings are due to capacity limitations with respect to what we are capable to identify (e.g., Engelkamp & Zimmer 2006: 59f.). This seems to be a feasible assumption, given the neurophysiological evidence, but it might turn out to be only half of the truth. Lab experiments have long concentrated on exploring either perception or action, so that experiments in visual perception were "decontextualized" from those practical contexts in which perception takes place in everyday life (see also Barsalou & Wiemer-Hastings 2005: 157 on this point). This harbours the risk of obstructing the close interrelation of perception and action, or better: perception for action. The above view of either purpose-driven or stimulus-driven identification thus provides an alternative perspective on selective identification (without excluding the "convergence" perspective), in that the question of which of all recognized stimuli are identified is answered in relation to the pertinence of these stimuli for action (cf. Glenberg 1997 and the comprehensive review sections in Hommel et al. 2001). As we have seen, an act includes the relation of an action schema to a purpose, as a means to put this purpose into effect (see Figure 2.7 in section 2.4). Purposes are either goals or interests. In order to bring about certain circumstances (goals) we must have concepts of them which might be many, if several ancillary action schemas have to be actualized in order to put the superior purpose into effect. We also need to have concepts for the results and (purposed) further outcomes (circumstances) of these intermediate action schemas. In actualizing all these action schemas in sequence, we expect to encounter all the component parts (stimuli) of the intermediate states, processes, or activities, since they are present as concepts. (One could say, we conceptually prime the identification of the stimuli to come; cf. Glenberg 1997: 8.) These stimuli will therefore be identified as necessary constituents of the conceptualized action chain which serves as means to put the superior purpose into effect (e.g., having coffee).

If we encounter stimuli not expected, interfering with our present purposes, and hindering our action we must also identify them. What we do in this circumstance is to modify the means by which we put our present purposes into effect, i.e., by modifying the intermediate concepts of results and further outcomes of the intermediate states, processes, or activities. In particular, we might "insert" subordinate purposes into the concept of the whole action chain due to the unexpected changes in our environment in the visual field. This would be the case, for instance, if a colleague's occurrence in my visual field interferes with my goal of making coffee. If she wants to talk to me and if we have to solve a practical problem, I have to modify my (complex) concept of the action chain leading to my having a coffee such that I must put into effect the new subordinate purpose first (solving the problem) while not "losing touch" with the goal of having coffee (which in fact could happen, due to memory limitations). These considerations are captured in Figure 3.10 which will be commented in turn.

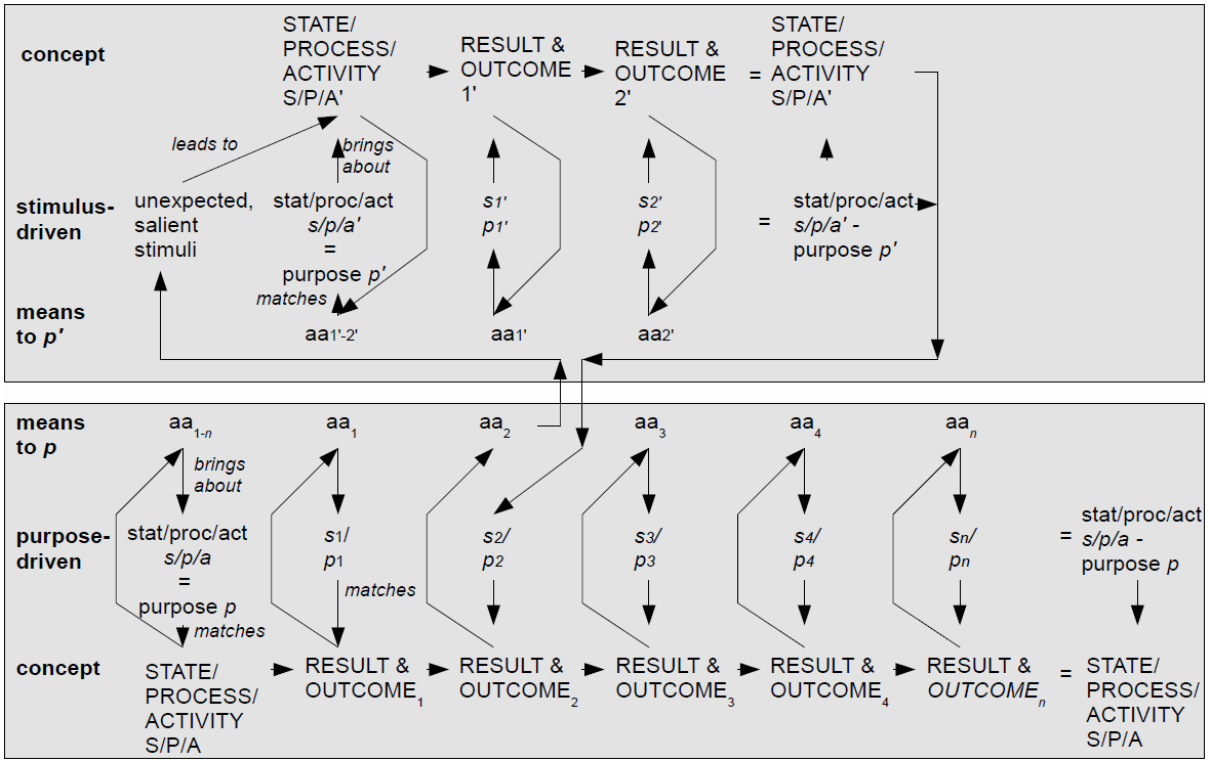

Figure 3.10: Purpose-driven and stimulus-driven identification

*(Figure 3.10 can be read as follows (lower panel): Someone has a purpose (*p*), i.e., wants a state/process/activity (*s/p/a*) to come about. He/she therefore conceptualizes this state/process/activity (STATE/PROCESS/ACTIVITY S/P/A) and the means to put it into effect (RESULT & OUTCOME$_{1\text{-}n}$). He/she actualizes the corresponding ancillary action schemas in sequence (aa$_{1\text{-}n}$), whereby he/she brings about several states/processes/activities (s1-n) which correspond to subordinate purposes (p$_{1\text{-}n}$), respectively. The states/processes/activities (s$_{1\text{-}n}$) brought about must match the corresponding concepts (RESULT & OUTCOME$_{1\text{-}n}$). These conceptualized states/processes/activities (s$_{1\text{-}n}$) consist of those pertinent stimuli expected to be encountered in actualizing the corresponding ancillary action schemas. Between aa$_2$ and aa$_3$ something unexpected happens, i.e., something salient comes into the visual field and must be identified (upper panel: stimulus-driven) because it hinders the realization of* p. *This leads to the conceptualization of a subordinate purpose* p' *which must be put into effect by means of similar mechanisms as in the purpose-driven action chain. The concept corresponding to* p' *takes the form of STATE/PROCESS/ACTIVITY S/P/A'. When* p' *is put into effect, i.e., when* s' *is brought about as the outcome of the last ancillary act, the actor can continue in the action chain serving the realization of superior purpose* p. *If* s *is brought about and matches S/P/A, purpose* p *is put into effect.*[83]

[83] The action chain constituting the pursuit of purpose *p* need not necessarily interfere with the action chain constituting the pursuit of the subordinate purpose *p'*, namely if actualizing the respective action schemas do not exclude each other. Thus, if the chain of acts of my making a coffee is not incompatible with the chain of acts of discussing a problem with my colleague, then they can potentially be actualized simultaneously. (My colleague would have to follow me into the kitchen while discussing with me, and I would have to talk while making coffee.) This would then simply be a case of a routinized action schema (making coffee) which need not be actualized with great attentional effort, therefore allowing for executing some less-routinized action schema simultaneously. A simple example of action schemas necessarily excluding each other would be that of jumping and walking, an example of action schemas excluding each other empirically would be that of breathing and swallowing (at least with respect to the average adult) (cf. Hartmann 1998: 123f.).

Such a view of the interrelation between action and identification in perception is at odds with views holding that we are only and always reacting (which is behavior, action-theoretically) to stimuli we come in contact with (cf. Hommel, Müsseler & Aschersleben 2001 who also emphasize the strong action-perception connection). As Zacks et al. (2007: 173f.) put it, "[p]erceptual predictions are valuable because they allow an organism to anticipate the future and to plan appropriate actions rather than reacting to incoming stimuli". Rather, we dynamically conceptualize purposes and the means to put them into effect based on the question of whether stimuli we encounter fit our purposes (pertinence) or trigger their modification or the modification of the means to get there (due to salience).

Conceptualization can presumably be routinized to a high degree, depending on the task difficulty which means that it can be executed without attention (cf. Barsalou 1999: 583, 2005a: 398ff.).[84] For instance, conceptualizing where to play the ball next in soccer match while monitoring one's own movements and those of the opponents is no problem for routinized soccer players, whereas it is more difficult to conceptualize the way from the town-hall to the train station under the same circumstances. It turns out then that looking at identification without taking into account its embedment in complex action dependences leads eventually to an oversimplification of matters. Emphasizing the priority of perception for action over perception as (mere) identification is identical with emphasizing the importance of the dorsal visual stream for action in relation to the role of the ventral stream in stimulus identification. The embedment of perception in action and action planning provides an explanation for DF's performance in everyday life which is characterized by pursuing purposes, choosing means to get there and actualizing action schemas. Goodale and Milner (2004: 19ff., 117ff.) report on her astonishing performance in tasks in everyday activities (making tea, for instance), given the serious damage to her temporal lobe resulting in a visual form agnosia. In other words, identification does not work, but action-oriented conceptualization works well in DF. This is due to the intact processing in her dorsal pathway which provides perception for action for which perceiving egocentric space is necessary.

What is the significance of pertinence for the discussion of the scenario in (II.1) where Nicole knocked over the milk? There are two ways in which pertinence compensates for some aspects of the underspecification of what Sarah and Jessica have perceived in that scenario. The crucial point is that Sarah's and Jessica's identification performance is purpose-driven in a double sense. Firstly, identification is always biased by someone's own purposes so that the respective outcomes of identification may be partially predetermined by something completely independent of the observable stimuli. Thus, being biased by their respective prejudices and attitudes towards Nicole, Sarah and Jessica may identify what they see in different ways. Secondly, judging events in the way exemplified in scenario (II.1) involves attributing pertinences to others. Sarah and Jessica will assume that the milk had some pertinence for Nicole, i.e., for her action planning. The question that remains open for now is whether Nicole's actual deed (knocking over the milk) is identified as the successful

[84] Routinization is a form of learning (also called automatization (e.g., Norman & Shallice 1984) and proceduralization (Anderson 1982)). It is the process at the end of which an action schema need no more be actualized with attentional effort. An indicator of when this is the case is that another action schema can be actualized simultaneously with the routine action schema, e.g., talking to someone while driving a car. Routinization takes place when an action schema is persistently practiced (cf. Hartmann 1998).

actualization of some planned action schema (allowing praise or reprimand) or whether such an actualization failed (disallowing praise or reprimand).

- These are already matters of action and attribution going beyond perception and conceptualization in the narrow sense. They will be further pursed in 3.2.1.4. The last perceptual/conceptual aspects of underspecification to be discussed are causal knowledge and knowledge about how objects and bodies behave physically. I will show that top-down processes make up much of the underspecification of percepts.

3.2.1.2 Features, affordances, relations, and the power of frequency

As humans engaging in a sociocultural praxis and interplaying with our environments within our lifeworld, we need to know about the features of (types of) objects which are relevant to put our purposes into effect. Furthermore, we need to know how – depending on the features they exhibit – different (types of) things move (see thing-circumstance taxonomy) in different (types of) states, processes, and activities, either to fulfil our needs by acting towards them, or to avoid threat to ourselves. We have to know that it is fluid substances we can drink, that we can pour drinkable fluids into cups and that we can lift cups to drink out of them. We also have to know that a balloon falling on our head does not endanger our well-being, while a falling anvil does. Most, if not all of our activities depend on our knowledge about how we can interplay with the objects in our environment and interact with people around us. Such knowledge is not only important to adapt well to one's environment and to be able to pursue one's goals in it but also for verbal interaction, since it is our knowledge about which circumstances are possible for some object, i.e., in which states, processes, and activities something can occur, which is also crucial for making appropriate utterances (think of *colorless green ideas sleep furiously*). With respect to syntactic (-conceptual) structures it is certain constructions in which certain types of states, processes, and activities are coded (cf. Goldberg 1995). We therefore have to know which construction is associated with which type of circumstance and under which setting of the interactional variables. For this, a state, process, or activity must be appropriately conceptualized on the basis of the (multi-modal) percept and prior knowledge, and its appropriateness or non-appropriateness shows up in the appropriateness of the construction by which it is coded in the circumstance in which it is uttered. (How the state, process, or activity is conceptualized by a person is opaque to his/her interactors until he/she has made it intersubjectively accessible by coding it in a conventional way by means of an utterance.)

In the sections on sensation we have seen that features of objects are only partially present in percepts, depending on the modality or modalities involved. What is not present in the visual percept of a milk carton is, for instance, its weight or the force required to move it in a specific way (and to specific ends, if present), or whether it is capable of motion or movement. But this is exactly the information needed by Jessica in (II.1) to make causal attributions. Because her utterance is a judgment of the described event including physical reasoning (relating to invisible object features and causal relations) and attributions (involving more abstract concepts like purposes, contexts, dispositions) we have to ask first for the

origins of her physical knowledge concerning what (kinds of) objects exhibit what (kinds of) features and can stand in what (kinds of) states, processes and activities. For such judgments to make, she has to rely on rich prior knowledge which provides her the means to go beyond what she has actually perceived with her utterance.

I will assume here that this knowledge is insofar grounded in perception in that concepts are memorized modally, not amodally in terms of a syntax of meaningless symbols (cf. Barsalou 1999, Pulvermüller 1999: 261ff., James & Gauthier 2003, Hauk, Johnsrude & Pulvermüller 2004, Pecher & Zwaan 2005).

This is already implied by the characterization of conceptualization as simulated perception above. However, not all of what affects our sense organs will result in having a concept of it. We form concepts only of those forms, shapes, colors, motions, movements etc. (i.e., the results of recognition), the differentiation of which is pragmatically required in the sense that it makes our interplay and interaction with our environment possible. As such, any concept, as part of long-term memory, originates in the salience or pertinence of things and their features in perception. The top-down conceptualization of something thus relies on those featural aspects which were salient/pertinent in perceiving an instance of it (cf. Glenberg 1997: 4) and which forces the perceiver to selectively attend to it (cf. Barsalou 1999: 583f.). Therefore, conceptualization is also neuronally based only on those features which were salient/pertinent during perception, i.e., there is neuronal activity due to salient/pertinent features, not due to all the features of an object (cf. ibid.). A concept is neuronally instantiated by the "re-enaction" of a state of a subset of neurons which are also active in perception. This is at odds with the classical view of concepts according to which the

> "conceptual system is a detached database. As categories are encountered in the world, their invariant properties are extracted and stored in descriptions, much like an encyclopaedia. The result is a database of generalised categorical knowledge that is relatively detached from the goals of specific agents." (Barsalou 2003: 536)

Instead of this, we have a concept of some feature because the corresponding tactile/visual/olfactory, etc. experiences we have had with some objects exhibiting this feature were salient/pertinent for us. Perceiving the feature is (always) accompanied by neuronal activity of the respective feature detectors in the respective modalities. If a feature becomes pertinent to us although it is absent, so that we have to conceptualize it, we are able to "re-enact" (Damasio 1989, Barsalou 2003) the corresponding perception.[85]

This simulation is accompanied/constituted by the partial activation of those neuronal assemblies which are also active in actual perception.

We thus conceptually single out object features by means of sensory(motor) experiences in our different modalities (cf. Martin 2007, Hauk, Johnsrude & Pulvermüller 2004) because

[85] I will use the term "simulation" here for this operation on the conceptual level and I will use the term "re-enactment" for this operation on the neural level. Simulation on the conceptual level corresponds to "re-enactment" on the neuronal level, then.

they facilitate purpose-rational action in our environment. There might be innumerable potential features humans actually do not differentiate because they are irrelevant and non-salient for them. It is, however, not possible without contradiction to make any assertion about them, since this would presuppose our having concepts of them.

Features of things vary in the degree of pertinence they have for us in different circumstances. When cutting is necessary, the sharpness of a knife's edge is more pertinent than its color. It is presumably in contexts of cutting that we learn that edges can be sharp. And it is certainly mostly knives in the presence of which something is cut. So, cutting is experientially bound to sharpness and sharpness to knives. As Mervis and Rosch (1975) have shown, there is a high correlation between the co-occurrence of specific features and the membership of the respective things in a category.[86] In other words, often (but not always, depending on the category) instances of a category share features. Knives are sharp, longish, and have edges. Birds have feathers and beaks. Cars have motors and four wheels etc. The perception of such things is accompanied/constituted by the firing of those neurons sensitive to the salient/pertinent features the things exhibit. Now it is obviously the case that the same objects are mostly involved in similar types of states, processes and activities, respectively, and play similar roles in them, respectively. For instance, books usually stand or lie somewhere, or are read, held, or carried, but seldom eaten, cut through, or cooked. Glasses are lifted, washed, poured with fluids etc., but they are rolled, thrown, or laid somewhere rather seldom. Such objects are important for us because few features of them (relative to all identifiable ones) are pertinent for us relative to present purposes. It is therefore mostly the same features of the same objects which are pertinent for us. Although there is an indefinite number of features a particular thing might exhibit, there are only few features of a particular thing (e.g., the sharpness of a knife) we actually identify in everyday circumstances. Identifying some features at the expense of others correlates with a specific pattern of neuronal activation instead of others related to other features. Analogously, categorizing or conceptualizing some object is probably accompanied by attention to those features which are also most frequently perceived. The neural co-activation of these features will be associated with this particular distribution of attention. In the long run, neuronal activation propagates most easily along familiar paths due to long-term potentiation. This is an „increase in the long-term responsiveness of a postsynaptic neuron in response to stimulation of a presynaptic neuron." (Ward 2006: 187; on how electrical currents are transmitted in the nervous system see Ward 2006, ch. 2).[87] I have already introduced the notion of potentiation on the conceptual level as "entrenchment".

According to these considerations, tools are not tools by nature, but by purpose, experience, and practice. Although a knife "is not" a screwdriver, it might be used as one, thus "becoming" a screwdriver. Imagine you have a problem with your notebook and need to open the bottom side. A screwdriver would open it, but you do not have one. There is, however, a

[86] Note, that there is an important difference in the assumptions of Mervis & Rosch about categories and those put forward here, in that Mervis & Rosch (e.g., 1981) assume categories to exist *a priori*, whereas I assume that categories exist because we make differences, whereby making differences is methodically "earlier" than its results, i.e., differences.

[87] Potentiation in the nervous system is in part made possible by neuronal plasticity and might be a source of cultural relativity. This is possible, roughly speaking, because things exhibit an indefinite number of features, so it could be dependent on cultural praxes which features of which things are pertinent (cf. Turner 2002).

knife lying on the desk. Identifying the knife in perception would, under normal circumstances, be accompanied by the co-activation (due to potentiation) of the most usual (i.e., frequent) features (e.g., longish, sharp etc.) necessary for action (cutting, buttering) relative to the current state of the perceiver (cf. Glenberg 1997). In the present circumstance, however, your purpose is to open the notebook for which you need something "functioning as" a screwdriver, so you attend to a feature of the knife usually less pertinent, namely the shape and form of its tip. If it is sufficiently similar to that of a screwdriver, you can utilize the knife to open the notebook.
Depending on our purposes we attend to specific features of things but not to others. Frequency and recency of experience shape the activation patterns associated with particular stimuli in the long and short term, respectively (cf. Tulving & Schacter 1990 on recency effects, or "priming").

Most importantly, those features identified (in perception) or conceptualized (for action) by means of selective attention determine and restrict the states/processes/activities the objects in question can be conceptualized to stand in.[88] Conceptualizing a knife and attending to its tip is not the appropriate means to conceptually prepare a cutting event but (rather) a screw-driving event. Conceptualizing a knife and focussing on the edge and its sharpness does not suffice for planning a screw-driving event but (rather) a cutting event. Depending on our purposes we identify/conceptualize objects actually exhibiting different features. It is these features which indicate and restrict the state, process, or activity in which the object may stand. The circumstance possibilities an object indicates on the basis of the identified or conceptualized features will be called affordances here (cf. Gibson 1979, Michaels & Carello 1981, Tucker & Ellis 1998, Grèzes & Decety 2002, Symes, Ellis & Tucker 2007, Buccino et al. 2009).

Things afford states, processes and activities only in dependence on their physical features as identified by a perceiver (they afford something to someone iff there is someone), on the physical makeup of the perceiver (a knife does not afford screw-driving to a donkey – "embodiment"), and on the present state of the perceiver (a cookie does not afford grasping to someone attending to the TV).
Due to our frequent and recent experiences, knives primarily afford cutting or buttering bread, containers usually afford putting things into them or putting them onto things, stones afford throwing, etc. Many affordances depend on such experiences and on prior knowledge of object functions. Many objects in our environments which have relatively fixed functions are artefacts, i.e., they were constructed in order to fulfil particular functions (knives, glasses, cookies, staple guns). As such, they have rather fixed roles in specific circumstances in that they repeatedly play the same roles in the same types of circumstances. Other things are not artefacts and do not have such fixed functions for humans (stones, trunks of trees, fir cones).

[88] Implicated here is my argument according to which the notion of traditional "selectional restrictions" (cf. Fodor & Katz 1964) which are imposed on "arguments" by "predicates" is flawed in that it states the wrong dependency direction: It is not relations which put selectional restrictions on objects, but it is objects whose features restrict the range of the relations they can stand in (cf. Kasper 2011). Related insights are entering prevalent theories of grammar and linking only very slowly. Groundbreaking in this respect is Pustejovsky (1995: 10) who states that "the diversity of complement types that a verb or other category may take is in large part also determined by the semantics of the complements themselves."

Occasionally, and depending on the featural complexity of the respective objects, an important difference between the former and the latter is therefore that in order to act purpose-rationally and functionally "appropriately" toward a staple-gun we have to know its function beforehand, while we need not have prior knowledge to infer from the shape of a stone that it qualifies for (affords) being thrown through the window of our fractious neighbour's house. Semantic knowledge is often but not always required in finding object affordances. Suffering semantic dementia[89] might lead to our failure in identifying a staple gun to be the right kind of thing to staple sheets of paper, while it need not hinder us in inferring from the shape of a shopping cart that it can be pushed by clasping the handle bar. In other words, one can distinguish between bottom-up and top-down affordances. In the former case, an object might afford states, processes, or activities to a perceiver/conceptualizer with his/her present purposes solely on the basis of its recognizable features without the involvement of semantic memory (cf. Craighero et al. 1996, Hodges, Spatt & Patterson 1999, Hodges et al. 2000). In the latter case, affordances of objects depend (besides the present purposes of the perceiver/conceptualizer) on prior knowledge (i.e., entrenched knowledge through long-term potentiation) about their functions which are not necessarily perceivable (cf. Tyler et al. 2003, Martin 2007). It is, however, possible to infer from the perceivable features of a staple gun alone that I can hit someone with it, if this was my goal. I might even infer from a multimodal analysis of a knife that it can be used for cutting, given the respective purposes. For this, I need not have an entirely intact semantic memory. The distinction between these two types of affordances is of importance because it grants patients of semantic dementia preserved means-end rationality on the basis of bottom-up affordances. That means, as illustrated in Figure 3.10, they can conceptualize and actualize action chains involving objects in order to put superior purposes into effect, if the task is sufficiently simple (cf. Hodges, Spatt & Patterson 1999).

Bottom-up affordances need not even depend on intentions to act. Craighero et al. (1996) have shown that neuronal activation patterns point to the fact that objects afford "action" to observers even in the absence of their intention to act. Strictly speaking, this is not action but behavior then, namely spontaneous behavior or a reaction. Interestingly, however, these bottom-up affordances depend on the body position of the perceiver relative to the object in question (cf. Tucker & Ellis 1998). According to Tucker and Ellis, the presence of bottom-up object affordances depends on whether the object is in the right position for actualizing movement schemas toward it, e.g., for grasping it, relative to the perceiver's position. If it is not, e.g., because it is inadequately oriented, it does not afford movement toward it, indicated by lack of the respective neuronal activation patterns. "Being in the right position" can thus be defined relative to egocentric space within reach, and this points to an association between egocentric space ("some object is directly in front of me"), proprioception ("what can I manipulate given the length, agility, and position of my limbs") and bottom-up affordances. In fact, this is the connection Norman (2002) has tried to establish. Strictly speaking, he has tried to unify the concepts of affordances and the dorsal stream (underlying egocentric space). Presumably, the bottom-up affordances of an object in egocentric space and within reach (which afford behavior schemas towards it; see above) may concur with top-down

[89] Progressive loss of knowledge about the meaning of words, the functions or significance of objects due to deterioration of brain regions which could not be clearly identified, yet (cf. Ward 2006: 73).

affordances of the same object in this circumstance, namely in the case when one plans an action toward this object (thereby actualizing one of its many possible affordances) which is not identical with what it bottom-up-affords: It could be that the cake lying in front of me on the table bottom-up-affords (my reaction or spontaneous behavior of) grasping it and putting it into my mouth, while at the same time it might be my altruistic intention to push it across the table to offer it to my colleague.

Naturally, not anything perceived or conceptualized is perceived or conceptualized as being within actual reach, and therefore it does not exhibit bottom-up affordances as a function of its position relative to the perceiver/conceptualizer in egocentric space. I would argue, therefore, that things out of reach for a conceptualizer (i.e., concepts as simulated perceptions) may nevertheless top-down-afford states, processes, and activities in which they may stand, namely either as simulated activity toward these objects (involving a viewer-centred reference frame) or as simulated perception of a relation between objects (involving an object-centred reference frame).[90] This can be accomplished thanks to the features to which the conceptualizer attends and which restrict the range of states, processes, and activities in which the thing(s) in question might stand.

Because the present work deals mainly with conceptualization underlying verbal interaction for which intact conceptualization performance is required, the term "affordance" will be used here for top-down affordances, since concepts are what underlies linguistic[o] sign-use. If reference to bottom-up affordances will be necessary, it will be explicitly mentioned. The three types of affordances I have introduced are depicted in Figure 3.11 below.

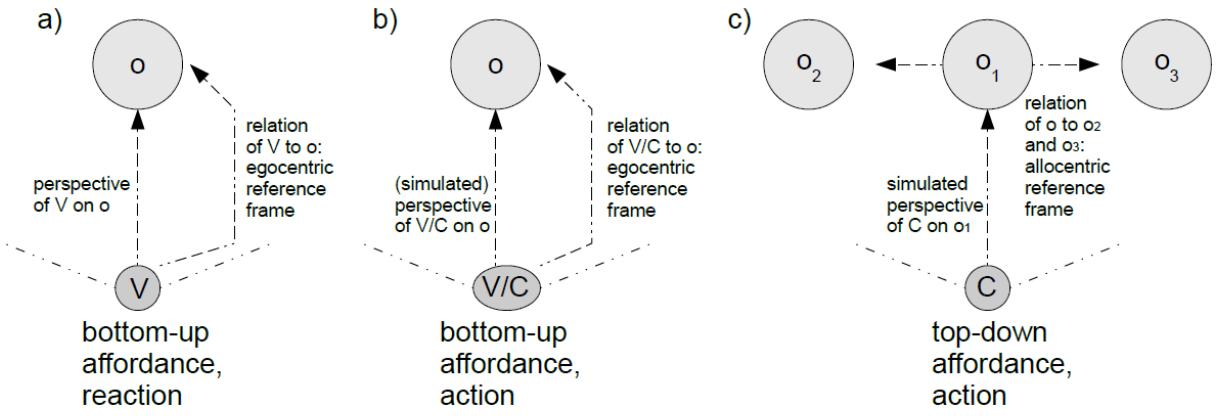

Figure 3.11: Bottom-up and top-down affordances
(V: viewer; C: conceptualizer; o_{1-n}: objects; dashed lines: visual or conceptual, i.e., simulated visual, field)

Figure 3.11 shows that there are three types of affordances: First, there are bottom-up affordances affording a reaction (or spontaneous behavior) of the viewer V towards object o. This is case (a). O is construed here in relation to V, i.e., within his/her visual field and within

[90] I take Young (2006) to be compatible with this view. In his article, the author extends the proposal of Norman (2002) in such a way that not all affordances are neuronally situated in the dorsal stream but also in the ventral stream which serves allocentric space (allocentric "where") and object features ("what"; see section 3.1.3.4 and Figure 3.7). This fits well with my proposal according to which it is the features of objects (ventral stream) which restrict the range of relations (i.e., what they afford) of objects.

egocentric space (viewer-centred reference frame). This type of affordance does not include retrieving knowledge from memory, because the object in question affords some circumstance by means of its most salient recognizable features alone (see section 3.1.4.1 on salience).
Now, type (a) affordances might concur with type (b) affordances. This latter type exhibits nearly the same setting, but the object's affordances are part of purposeful action. One could say that in (b) V/C (who is both a viewer and a conceptualizer) "exploits" some though not all affordances of o. He/she does this by conceptualizing an act (or action chain) toward o, thereby "calling upon" those pertinent features of o which condition o's involvement in this kind of action. At the same time other features of o which are irrelevant for V/C's purposes are discarded. A circumstance where (a) and (b) concur about which affordances are actualized would be constituted by a mismatch between those affordances based on the most salient features (= (a)) and those based on features pertinent to V/C (= (b)).
Case (c) depicts how affordances work in the absence of stimuli. The conceptualizer simulates a viewing perspective on o_1, but o_1 is not construed in relation to C but to other o's, i.e., the objects in the simulated visual field are construed in relation to each other, i.e., within an allocentric space and an object-centred reference frame. Those features of $o_{1\text{-}n}$ which allow them to afford certain states, processes, and activities in which they may stand are those pertinent features retrieved from memory in the course of simulating the perceptual experience underlying the concept of $o_{1\text{-}n}$
Summing up, objects afford states, processes, and activities in which they may stand to a perceiver/conceptualizer, whereby particular features of objects are singled out by means of paying attention to them (but not to others) on the basis of salience or pertinence, so that the range of circumstances in which the objects may stand is restricted by salient or pertinent features. Observing that different features of (kinds of) objects are involved in different (kinds of) states, processes, and activities, and constituting such differences through one's own acts and instances of behavior leads to the conceptual dissection of features which different (kinds of) objects exhibit. This last aspect also fits in the greater picture of gaining knowledge by means of observational learning and learning by doing:[91] The fact that people's actions toward

[91] Observational learning can be characterized as follows: If an organism perceives that the actualization of a behavior schema by another organism in some circumstance is reinforced and if this perception leads to an increase in the association strength between the behavior schema and the circumstance in the perceiving organism, then the behavior schema has been conditioned to the circumstance with respect to the perceiving organism (cf. Bandura 1965, Kawai 1965 for a possible example of observational learning in monkeys). Observational learning is – at least with respect to observed action schemas – necessarily incomplete without the subsequent actualization of the action schema by the observer. Someone who watches a basketball player shooting nine of ten free-throws into the basket will not learn to actualize the correspondent action schema by observation alone. The observed movement schemas of the basketball player are underspecified in the sense that the observer simply does not experience by him-/herself how the player controls his muscles and gauges his effort. The observer will have to learn to score in basketball by performing the throwing by him-/herself, since the "model" provides only partial information about what is necessary to score. We can term this learning by doing: Observing action facilitates performing the same action. However, observing action of others and actualizing action schemas by oneself seem to inform each other (cf. Bertenthal 1996: 436ff.). Feedback from one's own act allows one to very accurately predict afterwards (on the basis of perceptual information) whether others will succeed in engaging in the same task. In contrast, having no feedback from one's own performance and judging only on the basis of leads to lower accuracy in judgment (Franchak, van der Zalm & Adolph 2010, Wagman et al. 2008, Thornton & Knoblich 2006). On the other hand, having perceived another person actualizing a certain action schema allows one to recognize the relevant, rather global, movement schemas necessary to adequately actualize this action schema. In this case, observing another's action facilitates one's

objects follow sociocultural norms (think of the functions of artefacts, for instance, which are mostly obeyed in action) leaves room for the possibility that some of these norms override, or thwart, those acts which would otherwise be more "natural" on the basis of the merely physical abilities of the actor relative to the object.[92] In this way, the acquisition of object affordances involves sociocultural constraints from the very beginning.[93] One could go even further, remembering that whole cultures are constituted by praxes, and conclude that cultures are co-constituted by what objects (top-down-)afford to their members (cf. Sinha 2009 for a related idea).[94]

We have discussed three biases in identification so far, namely salience (a property of the stimulus relative to the perceiver), pertinence (an attitude of the perceiver relative to the stimulus) and frequency (which relates to affordances; a property resulting from the interplay of properties of the stimulus and the perceiver). As will be shown in the following section, the way we grasp the crucial concept of causation depends on several of these factors.

3.2.1.3 Causality as the enhancement of constant conjunctions and stimulus generalization

Our everyday interplay and interaction with our environments teaches us that not everything that happens depends solely on the features (identified to be) inherent to single objects. An apple affords peeling to us, and an apple can actually be peeled, but whether the apple actually gets peeled does not depend on the apple alone. Its being "peelable" is only one necessary condition of its actually being peeled. Another condition is the presence of an object which affords the actualization of a motion/movement schema the result of which is a "peeled" apple, i.e., a "peeler". In such instances we can say that the peeler has "caused" the peelable thing to be peeled, simply because we believe that without the presence and engagement of the peeler the peelable thing would not have been peeled.

Above, in the outline of those aspects with respect to which the percept is underspecified, I have characterized "cause" as a terminus of reflection, a manner of speaking with respect to invariances in the co-occurrence of objects or circumstances. This is yet a vague characterization of causation but it is due to the broad applicability of the term in everyday usage. Being identified (in perception) or conceptualized (for action) as the object or circumstance without which another object or circumstance would not have come about seems to be the only attribute which all instances of matters called "causes" have in common

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own successful acting – a case of observational learning, but non-sufficient observational learning (cf. Adolph & Berger ^{6}2006).

[92] Because learning by doing cannot be expected until the second half of an infant's first year due to lack of hand control (cf. Mandler 2004, 2010), observational learning will be primary at least for this developmental period.

[93] One need only ponder on the very little number of natural objects (objects which did not undergo poietic acts) with which infants and toddlers get into contact in order to get an impression to what high degree the top-down affordacnes of objects are prescribed to us by purpose of design. One would expect then a wider range of top-down affordances of objects for members of praxes with few(er) artefacts who use natural objects to numerous purposes. Sinha & Jensen de López (2000) provide evidence that this might indeed be the case.

[94] The notion of affordances based on pertinence, i.e., top-down affordances, also captures what Folli & Harley (2008) attempt to find in the notion of "teleological capability" which they characterize as "the inherent qualities and abilities of the entity to participate in the eventuality denoted by the predicate." (Folli & Harley 2008). This characterization seems rather unspecific. One does not know what "qualities and abilities" actually are, what counts as "entity" and what as "eventuality", and whether "inherent" captures features that would fall under bottom-up affordances in the present account, or whether they also include top-down affordances.

(cf. Lakoff & Johnson 1999: 177). Apart from that the members of the category CAUSE seem to exhibit extensive family resemblances (cf. Mervis & Rosch 1975, Wittgenstein [4]1980).
Philosophical investigation in causality is old (e.g., Aristotle 1995, Hume 1960, Kant 1998, von Wright 1974) and many old ideas – especially Hume's – have survived into the present and into actual psychological models of causality (cf. White 1990, Penn & Povinelli 2007[95] for two overviews). We are concerned here with the psychological notion of causality because we are concerned with the question of how we perceive and conceptualize causality, i.e., causes and effects in order to understand how it is reflected in linguistic° structures.[96] It is important to note that we do not deal here with objective causes (whatever this might be) but with those co-occurrences of objects, states, processes, or activities which perceivers/conceptualizers treat to be instances of causation in everyday life, as indicated by their (verbal) judgments about states, processes, and activities in their lifeworld. As such, we, as participants in everyday life, are in a sense naïve with respect to causal relations, since we are severely biased in our judgments without being aware of these biases, and we usually do not engage in a thorough investigation of what could have been the cause(s) of the circumstances unfolding before our eyes. Rather, we simply take as real what we identify and conceptualize (see Moskowitz' (2005: 21) notion of "naïve realism"), although it could have been identified and conceptualized otherwise. Therefore, in the above characterization of causes as necessary conditions for objects or circumstances the most important aspect is its general dependence on someone's identification and/or conceptualization performance. Causes are therefore not objectively given but imposed in a top-down manner. In other words, in our everyday verbal interaction we make causal judgments of the type given in (II.1) all the time, without having made prior scientific investigations about them. We make causal judgments as if causes were present and perceivable in the states, processes, and activities unfolding in front of us, although, as has been mentioned, perception is both fallible and underspecified with respect to several matters, especially including causation (see above, section 3.1.4). Apart from this constructive nature there is a second aspect about causal cognition which deserves mentioning, namely the necessity of being able to conceptualize counterfactual things, states, processes, or activities, since this is implied in the characterization of causation ("an object or circumstance without which another object or circumstance would not have come about").
We can now approach the question of what it is for humans what we term "causes". In accordance with the programme pursued so far I will assume that causal cognition is grounded in our everyday perceptual experiences in our lifeworld (cf. White 1988, 1989, 2009b). So, what is it that makes the relation between two objects or circumstances not accidental but causal in identification? Above, conceptualization was characterized as simulated perception, so it is consequent to consider those cues which are treated as critical for detecting a causal relation in perception to be critical in conceptualization, too.
Crucially, states, processes, and activities involve things. We have seen (section 3.2.1.2 on affordances) that things and their features and affordances determine the range of states,

[95] This article is questionable in its claims regarding animal cognition (cf. Janich 2010), but it is a fair survey of proposals concerning causal cognition in humans.
[96] See Schaffer (2007) for an overview about ongoing (analytic-) philosophical discussion about "the metaphysics of causation".

processes, and activities these things may stand or occur in. So, a state, process, or activity spa_1 which is a candidate cause of another state, process, or activity spa_2 is a candidate cause thanks to some feature/s or motion/movement of one of its constitutive things without which spa_2 did not exist. For detecting relations in egocentric and allocentric space it is necessary to recognize something which bears some spatial relation to some other thing. If there were no things, there would be no states, processes, and activities. Therefore, one cannot properly state that either circumstances or objects are the exclusive constituents of causal relations, i.e., instances of causes and effects. Rather, both are constituents.[97] Because something is round it rolls down hills (cause as state, effect as process). That is, this thing affords rolling because it is round. Because the wind blows the door slams shut (cause and effect as processes). That is, the wind affords blowing and the door affords motion. The door's affordance is actualized because the affordance of the wind is actualized beforehand. Because the milk carton has a flat bottom side, is higher than it is long and wide, it stands (cause and effect as states). That is, because it has these features the milk carton affords standing. Because the pope is old he breaks his femur when he falls (cause as state, effect as process). That is, because the pope is a physical body he affords falling. Because his femur is osteoporotic it affords fracturing.

In principle, the circumstances making up a causal relation are independently describable. Hume (1894: 29) states that "[t]he mind can never possibly find the effect in the supposed cause, by the most accurate scrutiny and examination. For the effect is totally different from the cause, and consequently can never be discovered in it." That means the effect is not contained in the cause in the sense of a logical connection, so that the relation between cause and effect is not an analytical one, as Kant (1998) would claim (though vetoing Hume). If there is no logical relation between causes and effects, what kind of necessity is it I have talked about above? In the sections on perception and identification it has been argued that the objects, circumstances, and especially the features we know are objects, circumstances, and features thanks to our differentiation performances within our lifeworld activities. It has also been stated that it is by experience that specific things occur in specific circumstances, depending on what they afford. And what they afford depends on the features they are identified to exhibit. Object affordances restrict the range of states, processes, and activities these objects may stand in. Because our differentiation performance in everyday praxis serves practical concerns (purposes and conceptualizing the means to get there) we aim at the explainability and predictability of what happens in our environments. Causal cognition must therefore also be seen in this context. It serves being capable of acting. Whatever objective or logical causality might be, then, it is not the type of concept important here. Rather, we can identify the kind of necessity in question as an experientially based necessity which once more rests on differences made within our lifeworld activities. Then, what is necessary is that the objects involved in the candidate cause of an effect must exhibit those affordances the presence of which makes this effect possible at all. And the objects involved in the effect must likewise afford what "has been caused" about them.

An instance of causation thus consists in the actualization of mutually dependent affordances in both the objects in the cause and the objects in the effect.

[97] This is the reason that I will occasionally talk of objects as causes/effects, and occasionally of circumstances as causes/effects.

The absence of the respective affordances excludes the possibility that it is an instance of causation. The causal relation is in this sense an experientially and practically necessary one. In anticipating what is yet to come this can be illustrated by means of our frequently-used example (II.1). For Nicole to be identified as the cause of the falling-event involving the milk carton it is necessary to know about the fact that Nicole as a human being and as physical body affords movement (action and behavior) and exertion of physical force (making contact and transmitting force through movement). One also has to know about the fact that the milk carton does not afford (self-induced) movement but – because of its physical features – only motion. Importantly, the milk carton affords motion only relative to human scale (embodiment); for an ant and for another milk carton it would certainly not. If in this visual perceptual circumstance nothing else than Nicole and the milk carton move, Jessica is all but forced to identify Nicole as the cause of the carton's falling down.

It is also this kind of mutual dependence in affordances which allows a characterization of the concepts of enabling and preventing (cf. Wolff & Song 2003): Some object o_1 can only enable some object o_2 to actualize some motion schema *ms* which o_2 affords, if otherwise o_2's motion would have been prevented by some object o_3 which blocks o_2's actualization of the respective motion schema because o_2's and o_3's affordances do not combine to produce the effect. For illustration imagine a bathtub filled with water and a plug blocking the water's running out through a drain. The water affords a special kind of motion ("running"). Being caught in a container (the bathtub) the actualization of this affordance would be made possible by an opening (the drain). The drain, however, is blocked by the plug, i.e., the plug prevents the water from running out of the bath. Because the actualization of the affordance of running of the water is dependent on features of the environment (in this case there being a drain affording "passing", and there not being a plug affording "blocking liquids"), prevention depends on the mutal dependence of the affordances of the objects involved. Removal of the plug, on the other hand, enables the water running out of the bath. Identification/conceptualization of preventers and "enablers" involve an aspect of counterfactuality: One can only talk about preventing and enabling if the "actual" affordance to be actualized is known, i.e., conceptualized previously. In order to know that in the above circumstance something is prevented or something must be enabled, I have to know in advance that water actually affords running and the drain passing.

Note that causality (including prevention and enabling) characterized this way is an entirely conceptual matter, i.e., the (visual) percept "contains" no causality, at least not the kind of causality discussed here.

This conception of causality was inspired by the proposal of White (2009a) which aims to characterize "the kind of understanding of causality that humans possess" (White 2009a: 1228). Similar to the programme pursued here, "there is no claim that this understanding accurately represents the truth about causality." (Ibid). In few words, what White proposes is that a causal relation is "a generative relation in which a causal power of one thing operates on a liability of another thing to produce some sort of outcome under a suitable releaser." (Ibid.). In the "causal power of one thing" we find the actualization of an affordance of the thing involved in the (candidate) cause. And in the "liability of another thing" we find the actualization of the affordance of either undergoing some motion or change by the thing

involved in the effect or of preventing it because of the liability being too great relative to the causal power. The causal relation exists only relative to the mutually dependent actualizations of affordances of both objects ("the causal power of one thing operates on a liability of another thing"). Contact is what provides transmission of force from one thing to the other and what releases the power of the causing thing to result in the outcome of the entire causal relation. If the causal power of a stone hitting a window is high enough in relation to the latter's resisting liability, then its causal power is released and produces the outcome, e.g., a broken window.

This does not mean that the mere existence of affordances suffices for the occurrence of any instance of causation. Rather, judging retrospectively whether two given relations are causally connected depends on their exhibiting the appropriate mutual affordances. If they do not, this could not have been an instance of causation. If they do, they are candidates for a causal relation. If in addition transmission of force is identified or conceptualized, this increases the probability that the relation is judged as a causal one.

There is obviously a problem with such a "causal power" and "liability" account as presented here. Whether or not something is identified/conceptualized as a causal relation depends on whether some transmission of power through contact is identified/conceptualized. Causality assessments remain precarious and rest on very limited evidence. In the case of identification in perception, causality assessments are always directed backwards in time, i.e., they are retrospective. An instance of causation will most probably be identified, for instance, if the candidate causes and effects perceived can be identified as actualizations of mutually dependent affordances in the things involved in the respective states, processes, or activities, and if contact can also be identified. Now, in many cases in which we make causal assessments, transmission of power is simply not perceived, although contact is perceived. In other words, while contact is visually perceivable, transmission of power is not. That means, unless it is the "I" which exerts or undergoes physical force, transmission of power is not perceived. Subtract transmission of power from two events, e.g., the flying of a stone against a window and the window shattering, and what you get is the mere conjunction of two events with the temporal and spatial priority of the former relative to the latter. Nothing in both events makes the relation a causal one, even if this conjunction was a constant one, i.e., if windows always shattered when a stone flew against them (cf. Hume 1894). Hume presumes that causation is not directly observable. Because causation was introduced as a manner of speaking, such an assertion would constitute a category mistake (causes are not things). But one could say that it is not directly observable whether there exists a causal relation between some states, processes, or activities. However, one could reply that it can in fact be directly observed. One need simply replace the window in the above example involving the flying stone by oneself and one will know that transmission of power is perceivable by the self. Then, the primal experience underlying our concept of causation might lie in our haptic system and the sensation of force (cf. Lederman & Klatzky 2009 on haptic perception, cf. Johnson 1987: 43 in the context of image-schemas).

> "In essence the haptic system, comprising skin pressure sensors and articular kinaesthesis […] registers information about the exertion of force and its effect on the object acted on […]. [T]he haptic system functions as a mechanoreceptor system […], that is, it detects the mechanics of interactions [i.e., interplay – SK] between the body and objects. As such it provides the

> fundamental data for causal understanding in terms of not contingencies but forces, specifically forces involved in actions on objects." (White 2009b: 155)

We can once more appeal to evidence from dissociations to ponder the plausibility of a primal haptic experience of physical forces. In cases of sensory neuropathy the respective patients lack proprioception to certain degrees. To name but one case, Cole and Sedgwick (1992) report on a patient suffering from neuropathy from the neck downwards. He performs poorly in tasks in which estimating and gauging physical force is necessary and stands representatively for this clinical picture which entails severely impaired causal cognition (see also Lafargue et al. 2003). Contrasting everyday performance of the congenitally blind and in patients of neuropathy indicates that while vision is expendable for intact causal cognition, haptics is not.

For assessing the causal status of stones flying through windows or girls knocking over milk cartons on the basis of visual perception this means that identifying this relation as causal instead of accidental involves an analogical application of one's own primal haptic experience of transmission of force to the case of an (only) visually perceived process or activity. Before explaining what is meant here by "analogy" it has to be pointed out first what other cues generally accompany the primary haptic experience of exerting/undergoing physical force:

Michotte (1963) presented visual stimuli (moving rectangles) to probands showing one rectangle A moving towards another rectangle B with constant speed, then coming into contact with B and stopping, while rectangle B moves off in the same direction as formerly A with constant speed. We have here the case of unperceivable transmission of force from A to B (actually, because it was presented on a computer display there was no force at all), while there is contact. Probands reported that A caused B to move which has come to be known as the "launching effect". However, the launching effect disappeared if the contact was too long, i.e., if too much time passed between A and B's contact and B's moving off (between 100 and 150 milliseconds; cf. White 1988: 38, Chaput & Cohen 2001). That means absence of temporal contiguity results in probands' identification of two causally independent events. Consequently, transmission of force is under normal circumstances accompanied by temporal contiguity of the processes/activities in question. But while the former implies the latter, the presence of the latter is contingent on that of the former.

Likewise, the launching effect disappears, if the spatial gap between A and B is too great (>10mm), or if the direction of B's motion after contact with A is too dissimilar from that of A (cf. White 1988: 39, Leslie & Keeble 1987). There is then also a spatial contiguity present when there is transmission of power, whereas the presence of the latter is again contingent on the former. Another condition for the occurrence of the launching effect is, roughly spoken, the identity or similarity of what is transmitted before and after the contact (e.g, a ball A rolling in a straight line against another ball B will normally not cause B to move off in a zig-zag-pattern).

All in all, the cues in visual perception accompanying transmission of power which is originally only haptically perceivable can be summarized in the so-called "contingency model" (cf. Cheng 1997: 367). It captures the induction process in a perceiver who faces several perceptual clues eventually indicative of causation. In doing so he/she has to "decide" whether this is an instance of causation or not. What the perceiver does in such cases is to calculate the contingency between a candidate cause and an effect by subtracting the

probability of the effect given the absence of the candidate cause from the probability of the effect given the presence of the candidate cause. The probability values depend on the frequency of co-occurrence of the effect with the candidate cause. The more positive the resulting difference is the more probably is the candidate cause a "generative" cause. The more negative it is the more probable it becomes that a cause is a "preventive" cause. If it is neither positive nor negative but nearly zero, it is more probable that the relationship is noncausal.[98] In the case of non-perceivable transmission of force as is the case with all visual perception, we must rely on cues for causality which are always contingent on transmission of force. Most importantly, however, such covariation data say actually nothing about there "really" being a causal relationship or not.

Although there is little conclusive research on the neuronal substrates of causal cognition, I would like to propose the following: Perception – including identification – of a relation as a causal one involves neuronal activity associated with identification of temporal and spatial contiguity, identity of what is transmitted and – most importantly – the neuronal substrates of haptic perception (which also knows a "what" and "where" pathway, cf. Lederman & Klatzky 2009). The respective neuron populations fire synchronously.

Now, in identifying a causal relation in the absence of haptic perception it is conceivable that those synchronously firing neurons also re-enact (simulate) the primal haptic perception of physical force alluded to above, despite the actual absence of a haptic stimulus. This would constitute a very similar kind of simulation as with conceptualization as simulated visual perception (see section 3.2.1).

Neuronally, the question of whether or not a tactile perception of physical energy is neuronally re-enacted is critical with respect to the question of whether or not some relation is identified/conceptualized as a causal one. If the identification of causality or non-causality is linguistically^{o} expressed and thus made intersubjectively accessible, this may surface as a causative alternation, e.g., *The window breaks* vs. *The stone breaks the window*.

It is very well possible that causal assessments subserve practical concerns, as defined in the subsequent section. That means judging some relation to be an instance of causation or not could be utilized as means to certain purposes. It follows from this that causal judgments can be used strategically, as an instance of action. On the other hand, such strategic identification/conceptualization processes can possibly be routinized to a high degree, i.e., they might be performed even in the absence of one's awareness of one's current goals and interests. In other – and presumably numerous – cases such processes are clearly instances of behavior, namely where the neuronal activities associated with causal cognitive activities are conditioned to certain stimuli. It is possible that many causal judgments – despite the absence of haptic "evidence" and the presence of only visual information – rely on stimulus generalization, i.e., there might be firing of neuronal populations specialized for tactile stimuli

[98] $\Delta P_i = P(e|i) - P(e|\bar{i})$, where P is probability, e is effect, i is candidate cause (present) and $\bar{i}$ is candidate cause (absent).

even in the absence of these stimuli, resulting in causal judgments on the basis of insufficient cues (cf. White 1989).[99]

Applying the considerations about causal cognition to our scenario in (II.1) this means that Sarah and Jessica are forced by the perceptual evidence to infer a causal relation between Nicole and the milk. There is spatial and temporal contiguity between Nicole's movement and the motion of the milk carton, there is contact between them, and what is transmitted is straight movement/motion. Causality must nonetheless be inferred because there are insufficient cues: Sarah and Jessica lack tactile experience of the contact. However, affordances and causality do not account for the different judgment of the event by Sarah and Jessica. So the next sections take into consideration some general principles that govern the most important cognitive operations people make. These principles will tell us why Nicole's knocking over the milk can be judged in fundamentally different ways.

3.2.1.4 The actor/cognizer as (limited, self-serving) pragmatic

The above treatment of identification and conceptualization, the central involvement of the notion of pertinence, and the dependence of feature identification and conceptualization on several biases reveal the most important characteristic of human conceptual activities: They subserve practical concerns.

This means identification and conceptualization subserve our purpose-driven interplay and interaction within and with our environments and in conformity with the sociocultural praxes we live in.

- This is the point where we turn towards a new subcompetence, action/attribution, and where – regarding our research-programmatic model – we leave the domain of cognitive psychology in order to turn to rather philosophical, sociological, and social psychological considerations.

Peter White (1984) calls individuals within the lifeworld "laypersons". Laypersons are opposed to experts. For our purposes experts would be, for instance, those individuals engaged in the scientific disciplines identified in sections 2.2.5/2.2.6 which are relevant for

[99] Covariation and contiguity information, coupled with stimulus generalization could be the factors underlying the learnability of the concept of causation, thus making a nativist conception of causal cognition unnecessary (cf. Saxe & Carey 2006: 162ff.; cf. Spelke 1994 for an example of a nativist conception of knowledge, including causal knowledge).
The idea that our concept of exertion of force consists in the simulation of a tactile experience as added to, or complementing, a visual (spatial) experience, might be similar to what Mandler (2010: 35ff.) has in mind when she claims that some of Johnson's (1987) image schemas are not primitives (for schemas see sec. 3.3.4). In particular, Mandler proposes that at least Johnson's image schemas of FORCE, RESISTANCE, and BALANCE are derivable in the following way: Only the spatial base underlying these claimed image schemas are indeed image schematic and can thus be captured by other, already existing spatial image schemas, like TRANSFER OF MOTION and others. Then, "force is a spatial concept that becomes enriched by becoming associated with certain sensori-motor experiences" (Mandler 2010: 36), and similar with RESISTANCE and BALANCE. I have attempted to trace those "certain sensori-motor experiences" back to a primal experience of pressure and stimulus overgeneralization. If I have understood Mandler properly, our considerations are compatible.

the subject-matter of this book. If one additionally takes their practical orientation into account, this makes laypersons "pragmatists", in White's terms.[100]
According to White (1984: 333f.) being a pragmatic layperson includes the

> "primary orientation […] to the practicalities of living. This involves a large number of practical concerns that vary in salience across persons and across situations. […] Processes of judgment, attribution, and inference are engaged in because of, to contribute to, and in a context of practical concerns. Outcomes of such processes are optimal when they satisfy whatever practical concerns are salient at the time."

Note that White uses the term "salience" here in a way which was reserved here for "pertinence" above (sec. 3.2.1.1). By "concerns", one can understand purposes, i.e., goals and interests as defined above (section 2.4; see also White 1984, fn. 1). Individuals in their lifeworlds might not even be aware of the pragmatic character of their cognitive activities, and this fact complements their naïve realistic attitude: People hold true what they perceive, without being aware of the pragmatic bias of their judgmental processes in identification and conceptualization (and, as will be shown, attribution). This is an important point because if we want to know more about people's verbal interactive competence, we need not know about how things actually are but about how people believe things are. It is how people conceptualize things to be what they code linguistically^{o}, not how things actually are. It took a long time for such non-objectivist semantics to become acceptable (cf. Lakoff & Johnson 1980, 1999, Jackendoff 1983, 2002: 294ff., Talmy 2000, I, ch. 1, Langacker 2008a). As outlined in the introduction to part I of this book, Cognitive-Functional Linguistics has risen in the last decades, filling in this blank.
In other scientific disciplines, taking in perspective perception and action for understanding people's action and behavior was accepted earlier, and the mistake of viewing human cognition as a mirror of nature was not made. Perhaps one could say, for instance, that branches of sociology and social psychology did not adopt a computational theory of mind, so they escaped the mirror-of-nature fallacy. Human action and behavior are motivated, and it is their motives which influence and bias cognitive activities, so it is impossible for concepts to be "realistic" in the sense of corresponding in a 1:1 manner to the things in our environments – as illustrated by the biases characterized so far.
Viewing the cognizer, i.e., the perceiver and/or conceptualizer, as a pragmatic also runs counter to the tendency in branches of social psychology to treat him/her as a lay scientist. Harold H. Kelley was a leading researcher in the field of causal attribution, i.e., in a field the subject-matter of which is highly relevant for our present purposes, namely uncovering the biases and mechanisms underlying perception and conceptualization that enter language structures. Following Fritz Heider (1958), Kelley (1973) proposed that

> "the man in the street, the naïve psychologist, uses a naïve version of the method used in science. Undoubtedly, his naïve version is a poor replica of the scientific one – incomplete, subject to bias, ready to proceed on incomplete evidence, and so on. Nevertheless, it has certain general properties

[100] But s*tricto sensu*, "layperson as pragmatist" is a *contradictio in adjecto* insofar as a pragmatist is a representative of a pragmatist philosophical position and as such the exact opposite of a layperson. Again, the difference between object- and meta-language has to be respected. Terming the layperson a "pragmatic" presumably fits the intended meaning better.

> in common with the analysis of variance [for making causal attributions – SK] as we behavioral scientists use it." (Kelley 1973: 109)

According to the lay scientist view, people on the street try to understand what happens around them by employing scientific methods (in certain ways poorly). Although one could consider it idle to evaluate the adequacy of a term like "lay scientist", I would argue that its application is indeed inadequate and that this has important consequences for the theory proposed here. Concerning the former claim, we are not lay scientists because we do not employ scientific methods in conceptualization. Research in social psychology (for overviews cf. Kunda [5]2002, Smith & Mackie [2]2000, Moskowitz 2005, Aronson, Wilson & Akert [7]2010, see also Hilton 1990) and research on naïve physics (cf. McCloskey 1982, 1983) in the last decades has uncovered systematic shortcomings in our physical and psychological reasoning performances. According to White (1984: 336),

> "[t]he errors made by subjects in human inference research are real but they occur because laypeople aspire to a set of standards different from those of logic. Lay inferential procedures are designed for information of the type and structure that is encountered in everyday reality; and independently of that, selection of inference or judgment is guided by pragmatic rather than by logical criteria. Subjects may not care, for example, to make an inference that implies an improper grasp of social reality. When common sense and logic conflict, common sense will win for practical reasons."

For the adequacy of the characterization of the "man on the street" as lay scientist this means that

> "[b]oth logical and scientific methods are unsuitable for the layperson. Scientific methods are only optimal to the extent that they are practical, and for laypeople under the circumstances of everyday life they are generally not." (White 1984: 338)

In what follows I will argue for the person on the street – I will call him/her actor/cognizer from now on because he/she perceives, conceptualizes, behaves, and acts within a sociocultural praxis – as pragmatic and against him/her as lay scientist. In order to do so I will present some evidence in favour of the former and some evidence against the latter. I will then show how being a pragmatic shapes one's attribution and judgment performance and how some residual determinants in identification and conceptualization can be deduced (see the list in section 3.1.4).

The exemplary cases I want to present in favour of the actor/cognizer-as-pragmatic view concern (a) self-serving attributions, (b) the attempt to attain closure in aid of predictability in spite of insufficient data, and (c) scientifically inadequate strategies in hypothesis confirmation.[101] Further arguments against the lay scientist view are (d) the correspondence bias, (e) the preference of efficiency over accuracy, and (f) the significance of the to-be-judged person for identification.[102]

[101] These are only examples of the astonishing shortcomings in human judgment and attribution performance, especially when it comes to other people. Kunda ([5]2002) provides a comprehensive overview over them. There is no *a priori* reason why these limitations in human understanding should be restricted to the social domain. Quite the contrary, as for instance McCloskey's (1982, 1983) and Smith & Casati's (1994) research shows. It extends quite consequently to the "mere" physical domain (see also Bertamini, Spooner & Hecht 2005).

[102] For further arguments see White (1984: 335f.).

(a) One important dimension in attribution, i.e., in imposing causal relations on percepts, is to evaluate whether someone (say, some woman) acted the way she did (e.g, she writes an essay indicating a positive/negative attitude towards Kim Jong Un) because of a personal stable disposition (e.g., she is pro/anti Kim Jong Un) or because of a situational factor (e.g., she was forced to write the pro/anti essay) (cf. Heider 1958 on "internal" and "external" attributions; Jones & Harris 1967 on this specific task (with Fidel Castro, not Kim Jong Un)). Confronted with the question of whether the woman was pro or anti Kim Jong Un, and given the belief she had had free choice to write the essay, most people would say that she was pro Kim Jong Un, if she wrote the pro essay, and against him, if she wrote the anti essay. This is not surprising. However, when asked what people think is the true attitude of the woman, and given the information that she was forced to write the essay, people did not refrain from giving the answer that corresponds to what the woman wrote – although they knew she had no choice but to write pro or against the dictator. What people do in this task is to severely underestimate the power of the situation (external factors) and to overestimate personal dispositions (internal factors). This effect is called the "correspondence bias" (cf. Gilbert & Malone 1995). There is, however, one condition under which the situation factor is not underestimated.

This condition relates to the so-called "actor/observer difference" (cf. Jones & Nisbett 1972, Moskowitz 2005: 275ff., Aronson, Wilson & Akert [7]2010: 139f.). Linguists might rather recognize effects of the person hierarchy in it (cf. Silverstein 1976, Bickel 2010). The correspondence bias is absent, if the to-be-judged action is that of oneself, i.e., the actor or 1st person. It is present, if the action in question is that of someone observed, i.e., a 3rd person (but see below for further factors).

In other words, our attribution would be quite different in the Kim Jong Un experiment, if we were personally concerned. It would not occur to anybody sane to attribute to himself a positive attitude towards Kim Jong Un solely on the basis of an essay one has written under external pressure. Imagine holding social, liberal, and democratic opinions belongs to your self-concept, i.e., the things you know, and know to belief, wish, fear etc. about yourself (cf. Aronson, Wilson & Akert [7]2010: 150; Smith & Mackie [2]2000: 104). Then you expect yourself to act accordingly. If you do not, this threatens your self-esteem, whereby "self-esteem = success : pretension" (James 1890, I, 310). If you know, or reassure, or admit that you could not have done otherwise because something about the situation forced you to do what you did, and that it was not your personal disposition that made you do it, then neither your self-concept nor your self-esteem are threatened. According to Aronson, Wilson & Akert ([7]2010: 141; my emphasis), "when people's self-esteem is threatened, they often make self-serving attributions.

To put it simply, these attributions refer to our tendency to take credit for success (by making internal attributions) but to blame others or the situation (by making external attributions) for our failures […]." (See also Gould & Sigall 1977, Brehm & Aderman 1977, Zuckerman 1979, Jonas, Stroebe & Hewstone [5]2007: 168ff.). We can substitute "success" and "failures" by "accomplishments" and "misaccomplishments" to bring this more in line with our action

theory. In fact, what I will call the accomplishment/misaccomplishment difference is another determining factor in how actors/cognizers close their underspecified percepts (and concepts) by means of attribution (see 3.2.3/3.2.4.).

Concerning the actor/cognizer, taking credit for accomplishments and blaming others for misaccomplishments as a habit in the scientific circus would not be very courteous. In everyday life it is quite common (cf. Sagatun & Knudsen 1982)).
(b) In section 3.1.3.3 I introduced the law of closure in the context of sensation. It states that in sensation missing elements are "filled in", if this yields a "good" shape then (cf. Wertheimer 1923).

We can observe a similar effect in our causal judgments, a large-scale law of closure, as a manner of speaking.

According to the large-scale law of closure, there is a need for closure in human identification processes. That means because the world is in constant flux, causal relationships, beginnings and ends of processes and activities are mostly imposed on what we perceive. We perceive events the beginnings of which (their causes) we did not perceive, and we also do not necessarily perceive their ultimate outcomes. In trying to evaluate the causes of some recognized process we search for a possible cause of the motion in our visual field. If we identify a plausible cause, we stop seeking. In certain circumstances, any explanation will suffice (cf. Moskowitz 2005: 215ff.). The need for closure is a need for structuring one's environment, for removing ambiguity and uncertainty from one's environment by giving an explanation to what is where around one. Structuring one's environment in this way makes action planning possible. If there is nothing predictable around us, it is impossible to plan our own movements in our environments. Bringing to closure what is happening around us is an effective strategy for being capable of acting at the expense of accurate causal judgments (cf. Moskowitz 2005: 364ff.). Systematically ignoring alternative explanations in favour of one's capability of action is a clear indicator of practical concerns. Action serves goals and interests. A scientist has to evaluate concurring explanations for a phenomenon and being satisfied with any one explanation is inadequate even for a lay scientist.
(c) If scientists want to know whether their data are compatible with their hypotheses, they look where the data fit the predictions of the hypotheses and they look where the data possibly contradict those predictions. Actors/cognizers in everyday life do not. They rely on a strategy usually called "positive test strategy" (Klayman & Ha 1987). If people have prior hypotheses or expectations about something to-be-identified, they search the perceptual data only for the evidence that fits their hypotheses and expectations. Negative evidence is not taken into account (cf. Kunda ^{5}2002: 112ff. for the relevant case studies). To use Kunda's example for illustration, imagine a single woman you know. Imagine further a friend of yours tells you he is interested in meeting someone. The woman should be extraverted, i.e., "friendly, outgoing, and comfortable around other people" (Kunda ^{5}2002: 112). Your task in this scenario is to evaluate whether he would like the woman you know, i.e., whether she is extraverted (this question functioning as hypothesis or expectation here). An accurate judgment would include finding evidence and counter-evidence.

> "It turns out, however, that we usually do not conduct such a balanced search for evidence. Rather, our searches tend to be one-sided. Most people would try to determine whether their friend is an extravert by seeking mostly evidence that she is in fact extraverted, and would not look nearly as hard for evidence that she might suggest the opposite." (Kunda [5]2002: 112)

(d) In (a) above the correspondence bias was introduced and it has been shown that its underlying mechanisms stand in opposition to scientific, or quasi-scientific, standards because it serves sustaining our self-concepts. Besides that, its underlying mechanisms are also often characterized as originating in the makeup of our perceptual apparatus (cf. Aronson, Wilson & Akert [7]2010: 132ff., Moskowitz 2005: 280ff.). Above we have seen that salience and pertinence of stimuli determine the contents of identification and conceptualization. To put it plainly, the correspondence bias arises because people and things (the role of traits/features of which are overestimated) are far more salient (and pertinent) than the circumstances in which they are involved (the role of which is underestimated, cf. Trope & Gaunt 2000), or, to put it differently, circumstances are not isolable stimuli (cf. Taylor & Fiske 1975 on the importance of perceptual salience).
(e) In making attributions about people and things, i.e., in inferring unperceivable traits and features of people and things, respectively, from what we perceive we apply certain heuristics. On closer look, however, these heuristics are rather rules of thumb than statistically adequate methods. According to the representative heuristic, for instance, we identify what we perceive as belonging to a particular category, if the stimulus is sufficiently similar to the exemplar or prototype concept in our memory. The stimulus is seen as representative of the category, then. In doing so, we often ignore factors which are also decisive of category membership in addition to similarity, especially base-rates. "Base-rate" refers to the frequency of occurrence of an instance of a category relative to the frequency of occurrence of instances of all other categories. Take the example of professions: The base-rate of bankers in the population is higher than that of bomb disposal technicians. Therefore, although some stimulus person might in some respect resemble a bomb disposal technician and might be rather dissimilar to a banker, base-rate information suggests a higher probability for the person to be a banker. Now, people tend to ignore base-rate information in favour of representativeness information (cf. Kunda [5]2002: 57ff.). This is yet another example of actor/cognizer's reliance on scientifically inadequate methods in favour of heuristics or "rules of thumb". Actors/cognizers face then a problem: Their judgments, attributions, and inferences about what they perceive must be accurate enough to make them capable of acting/behaving in their environments. As we have seen, their "methods" (if they can be called methods at all) do not conform to scientific standards, i.e., they might be inaccurate and result in inappropriate results, thus rather hindering instead of facilitating action/behavior. This insufficiency might be due to the fact that we have limited cognitive capacities and that we need quick (re-) actions, whereas thorough reasoning in aid of higher accuracy would take time.

What we apparently do is therefore to optimize the outcome of our cognitive activities by modulating an optimal relation between accuracy (applying adequate methods) and economy (put as little effort as possible into the task).

In other words, actors/cognizers do neither strive for accuracy nor for economy, but for efficiency, i.e., for maximizing both when they conflict (cf. Moskowitz 2005: 173ff.).
(f) In science, the outcomes of data analyses must not be dependent on positive or negative feelings towards the data. Judgments concerning the data must therefore always have an open outcome. People judging other people do not adhere to this ideal. Rather, the positivity or negativity of judgments regarding some person's action or behavior seems to be biased by the actor/cognizer's preconceptions about the to-be-judged person in terms of sympathy and antipathy, respectively. In this way, for some underspecified percept of an event which might be identified either as deserving credit or blame, credit will more likely be attributed to a person with which the actor/cognizer sympathizes and blame to one towards whom the actor/cognizer feels antipathy (cf. Gould & Sigall 1977, Brehm & Aderman 1977; note, that this sympathy/antipathy difference will be shown to interplay with the actor/observer difference; see sec. 3.2.3 and 3.2.4).
In sum, actors/cognizers aim at preserving or enhancing their self-esteem and for cognitive efficiency. Both facts fit the characterization of the actor/cognizer as pragmatic, the former for obvious reasons, and the latter because efficient processing optimizes one's capability of action/behavior in one's environment which is clearly a practical concern. Actors/cognizers are not lay scientists, since they do not attribute, judge, and infer accordingly. "Attributions are made for social and practical purposes, not for scientific or knowledge-gaining purposes." (White 1984: 342). In science, a principle of least effort might be desirable but it is appropriate only if results do not suffer from it. Taking into account the above evidence, it seems equally reasonable to view the individual in its lifeworld not as a lay scientist but also to turn the tables and to view the scientist as a methodologically educated and disciplined pragmatic who knows about his/her shortcomings and how to avoid them (cf. Kuhn ^{2}1970).
The above considerations should have made clear that – besides salience, pertinence, and the effects of frequency – the character of the actor/cognizer as well constitutes a central factor biasing and determining identification, conceptualization, and attribution activities. Being subjected to fulfilling practical concerns, being cognitively efficient, and preserving/enhancing self-esteem shapes the way we impose specifications on otherwise underspecified percepts. In what follows I will attempt to frame the mechanisms underlying attribution on the basis of the actor/cognizer as pragmatic. In doing so I will show how the factors determining and biasing identification and conceptualization (determinants) bring about certain effects in attribution (determinates). In later chapters I will try to relate people's attribution performance to linguistic^{o} structures. For now, Table 3.2 shows the "determinants/biases" and "determinates/biased" in identification and conceptualization.

determinant/ bias	determinate/ biased
salience	amount/range of possible causes
pertinence	disposition vs. situation attribution
frequency (familiarity)	cause vs. reason attribution
actor vs. observer	credit vs. blame attribution
accomplishment vs. misaccomplishment	
antipathy vs. sympathy	

Table 3.2: Determinants/biases and determinates/biased in identification and conceptualization

Our starting point was the assumption that what we perceive is underspecified with respect to several matters that are highly relevant with respect of our interaction and our social living together. It is to a considerable degree along matters of personal dispositions, forces of situations, purposes, accidents, pertinence, sympathy, antipathy, and so on, that our praxes are organized. Adequate identification of our perceptual input is the precondition of our purpose-rational engagement and our behavior within and towards our environments. Perceptual experiences must therefore be brought in line with those differentiations. If this is accomplished we attain closure (see above) which in turn makes controllable what happens around us in the sense that it becomes partially explainable and predictable (cf. Moskowitz 2005: 327f.). A state of closure is attained if the perceived relations among the objects in the visual field fit prior assumptions, expectancies, interests, or goals. Because actor/cognizers' identification and conceptualization performances are determined by such matters as listed in table 3.2 they might not even be aware of the underspecification of what they perceive. However, social psychologists have in part uncovered the factors and their interrelations (determinants/biases) on the basis of which it is possible to a certain degree to explain and predict which specifications are imposed on what is recognized (determinates/biased).
It must be emphasized that table 3.2 is not intended to suggest straightforward association between those elements in the two columns which share a line. Rather, the interplay of a particular setting of the factors in the left column determines the respective factors in the right column to come about. Another setting in the left column changes the outcome in the right column. Before these interrelations will be outlined, action competence (B A4) and action understanding (B A2) shall be discussed which are necessary for understanding how the interplay of the determinant factors leads to different outcomes in attribution/judgment performances of people.

3.2.2 Action competence and intersubjectivity

- In what follows I will outline in what ways the shortcomings of human actors/cognizers relate to their attribution performance. This in turn shall clarify the puzzle about scenario (II.1): How do Jessica and

Sarah come to make different judgments about Nicole's deed? What this means in terms of our research-programmatic model is given in Figure 3.12.

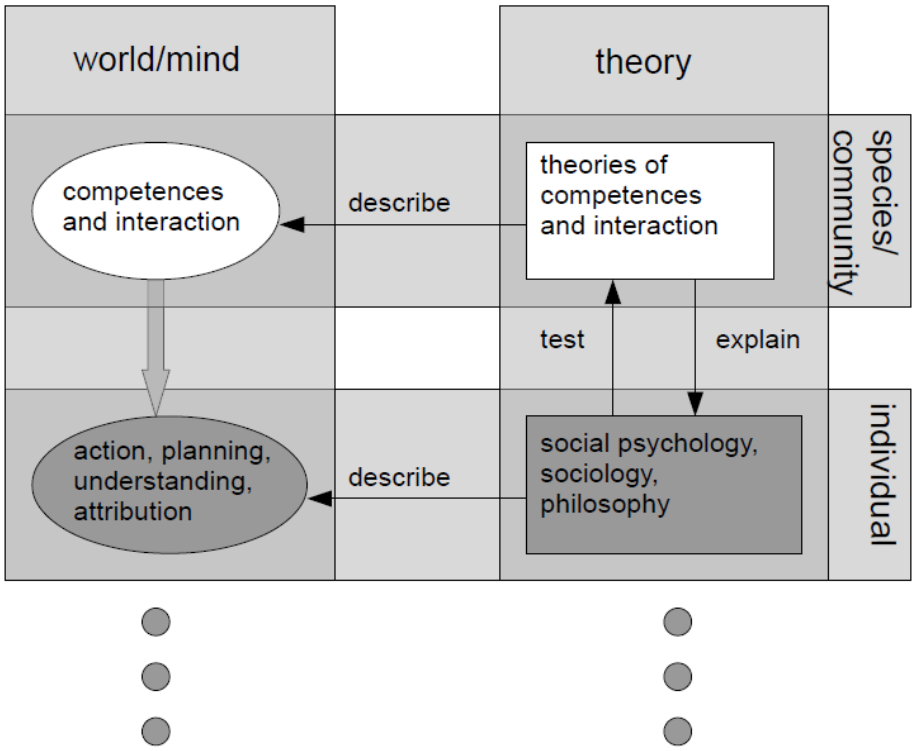


Figure 3.12: Action, action planning, understanding, and attribution as sub-competences of the linking competence that are developed throughout sections 3.2.2 to 3.2.4

3.2.2.1 Action competence

- In section 2.4 I presented an action theory. The differentiations it comprises are intended to serve as a terminological guideline, since these differentiations are grounded in everyday praxis and therefore warrant maximal intersubjective traceability of theoretical concepts and claims for their validity. One should therefore understand this action theory to be located at the research-programmatic level and as a normative manner of speech. It concerns the research programme because it deals with the question of how to talk about a subject-matter instead of with the subject-matter itself. For related reasons it is normative: Claims for validity in science cannot be justified by empirical research alone. Here and now we are concerned with an action theory as a subject-matter on the object-level of the theory, not on the research-programmatic level (B A4). It is obvious from the scope of the research programme, however, that we cannot leave the ground of the research-programmatic action theory when talking about what people think action is or is not.

The most important notions to be dealt with are again action and behavior. Research-programmatically, they have been characterized in the following way: Behavior concerns

those movements the occurrence of which is perfectly explainable and predictable by means of natural laws as established by the natural sciences. Action, on the other hand, cannot be explained and predicted in the same manner because it can be desisted from. There are no laws established, neither by natural sciences nor by humanities, by which action or interdependences of action would have ever been predictable. When it comes to the actor/cognizer, the person on the street, there are three main differences in his/her concepts of action and behavior from the research-programmatic one. First, the actor/cognizer does not use measurement devices or conduct experiments; more often than not he/she does not have any instruments and methods for doing so. He/she is a scientifically naïve judge and relies on rules of thumb (see above). That means he/she might have more or less good reasons for making and defending his/her judgments. Second, he/she pursues goals and interests. The correspondence or non-correspondence of a recognized state of affairs to his/her goals and interests influences his/her judgments. The person on the street therefore faces the difficulty of balancing the accuracy of judgment and the pursuit of goals/interests, when they are not easily brought in line, i.e., he/she has to get his/her judgments from face-to-face interaction. Third, his/her judgments and attributions serve his/her interplay and interaction with things and persons in his/her environment; therefore they have practical consequences, not research-programmatic ones. From these considerations three facts follow:

First, the person on the street might err and actually does err. Many linguistically^{o} coded judgments in everyday praxis remain unchallenged, as I would purport. It is their practical consequences which count. Therefore, truth values are primarily something scientists grapple with. In (II.1) above Jessica asserts that it was Nicole who caused the milk carton to fall down, in particular by means of a using linguistic^{o} form which in German implicates deliberate action (cf. Kasper [submitted for publication]). Although her mother controverts her assertion and "corrects" Jessica, she could as well have uttered something like "Go, get a cloth!" which leaves Jessica's assertion untouched but takes the blame off Nicole.

Second, the actor/cognizer might judge irrationally or selfishly. It might be because of a recent, non-resolved quarrel that Jessica readily blames Nicole for having caused the milk carton to fall down in (II.1) above. She might therefore identify the event in question as an instance of a deliberate knocking over of the milk carton. Were she not biased by her revengeful feelings (as temporal antipathy), she might have assessed the event differently.

Third, if one codes one's attributions/judgments linguistically^{o}, i.e., makes them intersubjectively accessible, one has to face the consequences of these judgments/attributions. Not only does Nicole have to accept the blame for what she has caused (she is blamed by Jessica), but Jessica has to take on responsibility for her utterance as well, i.e., her sentencing Nicole's deed (Jessica's judgment is vetoed by her mother).

It follows from this that people err and judge irrationally or selfishly with respect to the question of attribution of action or behavior to others and themselves (self-serving attributions; see above). Someone might attribute action to some other one because of some rule of thumb or some practical concern, although one could possibly have shown by adequate methods (or effortful reasoning) that this person's activity was behavior.

It shall therefore be proposed that the differentiation of action and behavior is not only research-programmatically but also psychologically significant. Because of the differences

between scientists and pragmatic actors/cognizers mentioned above the criteria for distinguishing both notions cannot be identical.

The criterion proposed here by which people in everyday praxis distinguish action from behavior is their attributing or non-attributing responsibility to someone for the occurrence of some state, process, or activity in question in accordance to the attributional praxis these people are part of.[103] Attribution and non-attribution of responsibility to someone – which might be a covert and internal activity – is indicated and intersubjectively traceable only by the overt expression of credit or blame, praise and reprimand to others – as (verbal and non-verbal) action.

Then, what is the knowledge of the scientist about which available method to apply to his/her data, that is the knowledge of the actor/cognizer in his/her lifeworld about what the conditions are under which to attribute action or behavior to him-/herself or others (i.e., to attribute credit or blame to someone, to praise and reprimand someone). As Janich (2001: 25; my translation; emphasis in original) puts it,

> "acts are *ascribed to* [zugeschrieben] or *imputed on* [zugerechnet] us by fellow human beings in the following sense: When, for instance, in a throng someone steps on some other person's foot or jostles him with the elbow in the ribs, the decisive criterion for all involved persons is whether this happened intentionally [mit Absicht] or accidentally [versehentlich]. This example stands for a general distinction which is indispensable for people's living together. There is then a distinction between what is ascribed to a person by his fellow human beings as accomplishment, credit, or fault, and what a person could not help doing [wofür diese Person nichts kann]."[104]

Often, intentionality and/or deliberateness are mentioned as indicators of the presence of action (especially in analytic philosophy, cf. Setiya 2010 for an overview). In the account pursued here, both notions are methodically subordinated to that of action. That means one can characterize what action is without referring to intention/deliberateness but not the other way around. To have this illustrated, imagine a scenario in which you observe someone holding a hammer in his/her right hand and a nail between his/her left thumb and forefinger. He/she holds the nail against the wall and delivers a powerful hit to his/her thumb. According to Hartmann (1996: 83; my translation), because we know

> "that in such situations something usually should be hung (on a wall), we also know, without needing to ask the person about [his/]her intentions, which action was originally intended as an appropriate means for doing this (namely hammering the nail into the wall). Attempts are often made to explain the distinction between action and behavior with the remark that, in contrast to behavior, actions are deliberate or intended movements. This is in fact true, but unfortunately, methodically, the term 'deliberateness' cannot be defined before the term 'action' has been explained. Whilst the distinction between action and behavior can be established by means of examples without recourse to the term 'deliberateness', talk of 'deliberateness' does not become relevant until it is related to a failed act."

[103] For reasons of convenience of expression, the phrase "attribution or non-attribution of responsibility to someone" should be understood to also include "overtaking or non-overtaking of responsibility" where the judging person is also the causer.

[104] Orienting myself on sociological terminology, I consider *ascribe* and *impute* to be synonymous in this citation, and both to be synonymous with the term I have used so far, *attribute*.

Neglect of this problem in the psychological literature is noteworthy. Although Hartmann's concerns are questions of the philosophy of science, his considerations are nevertheless applicable to a characterization of the person as pragmatic in everyday praxis. Because Hartmann conceives of the theoretician (and of himself as a philosopher of science) as a participant in a sociocultural praxis and not as an external observer, he is originally in a position similar to that of any other of its participants, especially including the person "on the street". The psychologist, the neuroscientist, the philosopher, and the sociologist face the problem of how to define the conditions under which intention can or should be attributed to someone or not. Similarly, the actor/cognizer "on the street" faces the problem of how to decide, given limited positive evidence, whether or not to attribute intention to someone, i.e., whether or not to blame someone for what he/she has "done". Unfortunately, theoreticians often forget two things about "intentions". First, the felicity conditions of the application of the term include being able to trace it back to lifeworld differentiations, because otherwise there are no means by which claims of validity for its application could be maintained. Second, if it can be grounded in lifeworld differentiations, we have to ask under which circumstances the actor/cognizer has learned its adequate application. Simply speaking, what authority can judge the veridicality of the attributions of (i) the theoretician with respect to his/her subject-matter, i.e., some individual, (ii) the lifeworld pragmatic with respect to some recognized other individual? The answer is: There would be none if the theoretician-attributor and the lifeworld pragmatic-attributor were not themselves participants in a sociocultural praxis which provide the criteria for the validity of their claims, i.e., the origin of their attribution competence. With this, we have arrived at the question of how we gain the ability to understand others' movements (action or behavior), i.e., to decide – given the respective perceptual experience – whether what we have just observed is an instance of action or behavior. One need only think of so-called "bodily emission" events (cf. Goldberg & Jackendoff 2004: 537), e.g. farting, belching, stinking, and the conditions under which they are considered to deserve credit/blame or to be excusable, for a sample of how delicate these tasks are in everyday praxis.

According to Janich (2001: 25), for most action theories, the starting point for reflections on the capability of acting is the individual being. A reflection on the conditions of action – of which its embeddedness in a cultural praxis (interaction) is part – is therefore missing from the very beginning, resulting in the aporia of justifying claims for validity and the origins of understanding action at all. We must therefore agree with Janich in saying that any attempt to understand human action that does not start out from an already functioning praxis of a community is doomed to fail.

In other words, the capability of an individual to act/behave can be understood only if one explains it in terms of the genuine commonality of the everyday praxis (see also Mead 1934: 6f., Abels [4]2007, ch. 1, Schneider [3]2008, ch. 3, Abulafia 2008, and other works on symbolic interactionism).[105]

[105] Symbolic interactionism shall serve here only as an example of a sociological theory which defies "individualistic" conceptions of an action theory. It does not broach the issue of claims of validity, however.

This praxis is the ineluctable instance for judging any assertion concerning human competences. And it seems to be the case in the cultural praxis many of us are participating in that there is a lifeworld distinction between what is "intended action", "guiltlessness", and "negligent action" in jurisdiction. They resemble what has been called "action" (including desistance) and "behavior" in the research-programmatic action theory in section 2.4, and what could be called "permissive action", (cf. Janich 2001: 26, Harras 2002), respectively. The difference between the terms taken from jurisprudence and those concepts taken from the lifeworld lies in the applicability of the latter to any possible instance of movement, whereas the former are applied to events with somehow negative outcomes.

> "When people in everyday interaction [täglicher Umgang] as well as in the legislative system enact these graded differentiations (namely in judging other persons as well as in evaluating one's own deeds) and in doing so accept them, we have to ask next where people get that competence from." (Janich 2001: 26; my translation)

Now, taking these suggestions as a rationale, it would seem that action and behavior are not objective notions for actors/cognizers in their lifeworlds. They are learned through praxes of attribution. And if that is so, their application in identification, conceptualization, attribution, and verbalization has to be acquired, i.e., learned by means of examples and counter-examples in our early ontogeny.

> "With respect to the actions of the persons closely attached to the child that are executed in its presence, the following factors play an important role: demonstration and imitation as well as commentaries on what is demonstrated, corrections of what was imitated inaccurately, praise for accomplishments of the child etc. That means that demonstrating and imitating are verbally conducted by these persons. This attendance when imitating consists in, for example, praise or reprimand, encouragement or correction, in short: a positively or negatively sanctioning commentary. The child is casually schooled in apprehending and executing those activities which are attributed to it as accomplishments or misaccomplishments by their closely attached persons. With this, the following appears as a primary and important criterion for the presence of an action: (an) action is what is attributed to the actor as credit or fault by other humans. […] Positive or negative sanctions therefore refer to success and failure – in the opinion of the sanctioning person." (Janich 2001, 28f.; my translation)

What is crucial here is that the attribution of credit and blame depends on the belief of the attributor. Who executed an action, then, or not, depends on who is attributed action or not by the actor/cognizer, independently of what might objectively be the case. Credit and blame for successful or failed actualizations of actions schemas is, however, not the only evaluative dimension here. If it is eventually the purpose of a child to be praised it is a precondition to actualize some action schema successfully. As the distinction between successful/failed and effective/ineffective with respect to the relation between action schemas and purposes implicates (see Figure 2.7), the relation between the successful actualization of an action schema and the coming about of the purposed circumstance is a contingent one. That means the desired praise might be missing, although the action was successful. It is not until the child realizes this contingency that its assessment of its own action is detached from the attributions of its closely attached persons.

Janich (2006: 80f.) calls this notion of action "ascriptivistic" and opposes it to an "authenticistic" one.[106] The difference between the two lies in the authority which decides whether some movement is to be identified as an instance of action or behavior. By contrast, according to an authenticistic conception of action, this authority is the mover himself. An ascriptivistic conception of action is based on the assumption

> "that every actor[/cognizer – SK] must have had a learning biography within a culturally molded action and discourse community [Handlungs- und Redegemeinschaft] in order to have learned what he is attributed as credit or blame – as opposed to mere behavior which receives no such assessment. […] That means we are attributed by other people, first of all in our learning biography, whether or not we act – therefore shall this concept of action be termed ascriptivistic." (Janich 2006: 81; my translation)

Crucially, this does not only concern internal attributions and assessments, i.e., those complementing identification and conceptualization, but mainly externalized ones, i.e., those conceptualizations which are coded linguistically^{o}, since they are intersubjectively accessible.
As a consequence, before we (in ontogeny) "know" what instances of action and behavior are, we are attributed with credit and blame by those nearest us for what we (neutrally spoken) "do" (i.e., our movements). Being attributed credit and blame and experiencing praise and reprimand for our "action" in childhood (which are real, concrete experiences) means being ascribed the competence to conceptualize a circumstance we want to come about (the competence to set purposes autonomously), being able to conceptualize alternative appropriate (sequences of) acts to bring it about (means-end rationality), and the competence to actualize the respective action schema(s) to bring this circumstance about. That means we might be treated as intentional and action-competent beings even before we "learn" what intentionality actually is (in the sense of Hartmann), namely a manner of speaking about invariances in the relation of action schemas to purposes as we have learned them within our cultures by observing how our attachment figures judge us or others (by observational learning) as well as by their feedback to our attempts to make judgments about others (by means of learning by doing).

We must learn what is attributed to us as action and what is not in order to become part of a cultural praxis, and within a community there is hardly a way not to learn it. What I have called the genuine commonality of everyday praxis is thus the precondition for understanding action in general.

To pick up my criticism toward Cognitive-Functional Linguistics from section 2.1.2 again: It is precisely at this point, with the distinction between "authenticistic" and "ascriptivistic", that CFL, emphasizing individual cognition, falls short of supra-individual matters of language.
The autonomy of the pragmatic actor/cognizer consists in his/her competence to conceptualize any state, process, and activity he/she wants to come about, avoid, or maintain. This competence is presupposed by any member of a sociocultural praxis for any of its members, and it is the ineluctable reference point for assessing interactions at all. Rationality of means-end choice consists in the competence to dynamically conceptualize the means (which

[106] The German terms are "askriptivistisch" and "authentizistisch".

ancillary action schemas to actualize) to a purpose, i.e., to be able to conceptualize the most effective means to a purpose, depending on the circumstances of the task (see Figure 2.7: relation of action schemas to purposes). Control over one's own actions based on a "model" of one's environment is clearly part of an action competence and needs to be mentioned, but shall not be discussed further. The emphasis rather lies on partially common physical substrates for action and perception as outlined above which shall serve as a basis to model a knowledge structure in which perception and action are intimately linked.

3.2.2.2 Intersubjectivity and understanding action

> Understanding an act requires the ability to specify to which purpose the movement (chain) in question was considered a means to put into effect. Understanding action in general requires the ability to tell apart those movements which are acts and those which are instances of behavior on the basis of the attribution praxis enacted within the respective lifeworld.

Identifying (in perception) and conceptualizing someone's action thus involves extensive simulative cognitive activity because in order to identify/conceptualize someone's actual movement as an act toward some purpose the realization of which potentially lies in the future, we must prospectively simulate performing what the other is actually performing to understand his/her purposes by conceptually simulating bringing his/her purpose about by oneself.[107] We therefore need some knowledge about "typifications of interaction [and interplay – SK] patterns which are socially approved ways of solving typical problems […]." (Schutz 1956: 75). These typifications take the form of action and event schemas. When I see someone standing at a wall, facing it and holding a nail against it with the left hand and when this person hauls out with the other arm in which is a hammer, then I can identify that this movement is an instance of hammering which is part of the action chain the purposed outcome of which is a nail plugged into a wall. For being able to identify the whole action chain by simulating its outcome prior to its completion I must have experienced events of this type before which have led to an entrenched concept of HAMMERING NAILS INTO WALLS by means of the long-term potentiation synaptic connections. Commentaries, previously explicated action plans, credit and blame, praise and reprimand accompanying the performance could serve as indicators of the outer boundaries of processes and activities for an observer, e.g., a child perceiving such an event the first time, thus aiding the development of schemas.

Conceptualizing an action chain in order to understand to which purpose some action is a means can only function if this conceptualization takes place from the perspective of the observed person. In other words, the act must be conceptualized, i.e., simulated as the one of the person who shall be understood. For instance, Ruby & Decety (2001) have shown that conceptualizing action of a third person results in a neuronal activation pattern that largely overlaps with that of actual first person action. This simulation process is often termed

[107] This simulation might take the form of a mental, or cognitive, simulation, involving activations of regions in the premotor cortex which are also activated when some action schema is physically actualized (cf. Rizzolatti 2005).

perspective-taking, a hot topic in sociological theories since decades and having entered cognitive sciences rather belatedly (cf. Etzrodt 2003: 208ff. for an overview in sociology, MacWhinney 2005 for a resumption of older ideas in cognitive science). Schütz & Luckmann (2003: 99) talk about the idealizations of the "interchangeability of perspectives" [Vertauschbarkeit der Standpunkte] in this context. It is a theoretical idealization, however, because in praxis we do not know to which degree our simulation of another's action plan conceptually resembles the person's own action plan (note that concepts function modally as simulated perception). Possible dissimilarities remain undetected as long as they do not result in obvious misunderstandings.

This means complete understanding is an idealization, since the entire overlap of conceptualizations of "me" and "you" and "him/her" is – due to differences in concepts and to differences in pertinence systems – virtually impossible (see also introduction to chapter 4).

A further indicator for what is to happen in a "person-hammer-nail" scenario could be the affordances of the "things" involved for an observer, e.g., a child. Let us assume the child knows that self-induced movement and exertion of physical force are affordances of humans, and that it has at some time or another examined separately a hammer and a nail or something similar in features. Then the child could potentially conceptualize an action based on the affordances of these things, namely a person clasping the handle of the hammer and striking with the flat face of the hammerhead at the nail head. This is in no way farfetched given the fact that hammers and nails are artifacts, the shapes of which exhibit mutual affordances by purpose of design. Inferring a relation between them on the basis of their shape is therefore only natural.
However, affordances give no hint as to the purpose of the act. Even if the child knew that the hammer thing should strike the nail thing, it could not infer what this is good for. For this, the clues (and frequency of observation) mentioned above would be required, namely an inescapable lifeworld in which acts are constantly embedded in means-end dependencies and where states, processes, and activities are accompanied by mimic, gestural, or spoken comments.
At this point we can return to the sympathy/antipathy difference briefly. So far this difference cannot be deduced from the overall framework developed here with regard to perception, conception, and action, whereas the notions of salience, pertinence, frequency, the actor/observer difference, and the accomplishment/misaccomplishment difference can be derived from it. I will attempt to make up for this now.

I would like to propose reducing the sympathy/antipathy difference broadly to the believed presence or absence of a shared purpose, respectively.

This in turn can be reconstructed by means of the notions of simulation and embodiment/resemblance in the following way: I have claimed above that the default case in the "natural attitude" within our lifeworld is that of a person pursuing purposes. At the same time we take for granted that other persons are pursuing purposes as well (cf. Schütz & Luckmann 2003: 29ff.). Conceptually, purposes – which are either goals or interests – take the

form of state, process, or activity concepts, i.e., simulations of perceptions of circumstances. Now, a shared purpose is believed to be present when the actor/cognizer believes that the concept of the purpose of the person in question matches the concept of his/her own purpose and if this person's actualization of some action schema in question looks to the actor/cognizer as if it were the appropriate means to put into effect "their" coinciding purposes. What the actor/cognizer has done in this case is to identify someone's (believed) purpose with his/her own purpose. In this sense of "identify", one could say, the actor/cognizer makes one purpose out of two. As a consequence, what applies to one's purpose also applies to the other's. What is crucial, however, is that the actor/cognizer believes, or actually judges the purpose of the person in question to be identical with his/her own. It need not factually be identical. (It is identical if both persons have a common purpose and know that they do.) Now, his/her belief in identical purposes is what causes the actor/cognizer to sympathize with someone with respect to this person's movement. The more incompatible the purposes of both the actor/cognizer and the perceived person become, the less sympathy the former brings up for the latter in his/her attribution processes. Incompatibility could be thought of as empirical incompatibility and governed by frequency and recency. Imagine I want my partner's and my house wall to become yellow (i.e., the house wall being yellow is my goal) and my partner buys red paint. Then I know from past experience that buying red paint is most probably not an act which qualifies as appropriate means to put the purpose of having a yellow house wall into effect. As a result, I will not identify my partner as having the same goal as I do. Incompatibility presumably increases with the degree of inappropriateness of some (identified) action schema relative to an (attributed) purpose.

Now, attributing those purposes to other persons that match our own plausibly correlates with these persons' capability and competence of conceptualizing sufficiently similar states, processes, and activities as desired outcomes of action as we do. It is possible and plausible to assume that we ascribe this capability and competence to beings that share the habits of our sociocultural praxes to the highest degree. These beings would therefore most probably be our most closely attached persons, i.e., mostly kin, partners, and friends, as well as other human participants within our lifeworlds, and so on, maybe quite similarly to the logic of animacy hierarchies as they are established in linguistics (e.g., Silverstein 1976, Comrie 1981, Bickel 2010). The units on such a hierarchy of "resemblance" to the self can thus be identified as being socioculturally determined, with the "resemblance" of close others originating in similar biographies and joint ventures within a sociocultural praxis the action and attribution performances of which are shared by the self (see also section 4.2 on this topic). Descending along the hierarchy we find beings that increasingly deviate from that and from our bodies and modes of action, thus resembling us less and less. Maybe, such an internalized sense of "embodiment" is the reason for our refraining from attributing "we"-intentional states to (most) animals and inanimate objects, in the sense that we do not share purposes with them.[108]

[108] The idea of treating the animacy hierarchy as a scale concerning the similiarity of an entity to the self is not new. To my knowledge, Langacker (1991) was the first. Dahl (2008) makes a similar proposal. However, both lack a full-fledged action-theoretic grounding, or reconstruction, of the notion.

3.2.2.3 Causes and reasons

We have reached a point where we can distinguish the factors that influence an actor/cognizer's identification or conceptualization of motion, behavior and action (the latter two as instances of movement) and their relation to causation. The following considerations rely on most topics discussed in section 3.2. The Figures to follow are organized into three "layers". The uppermost layer represents sensation/identification/conceptualization. The middle layer shows how one would talk about the identified/conceptualized events in terms of causation. The lowermost layer captures the events in action-theoretic terms. To start with, consider Figure 3.13 first:

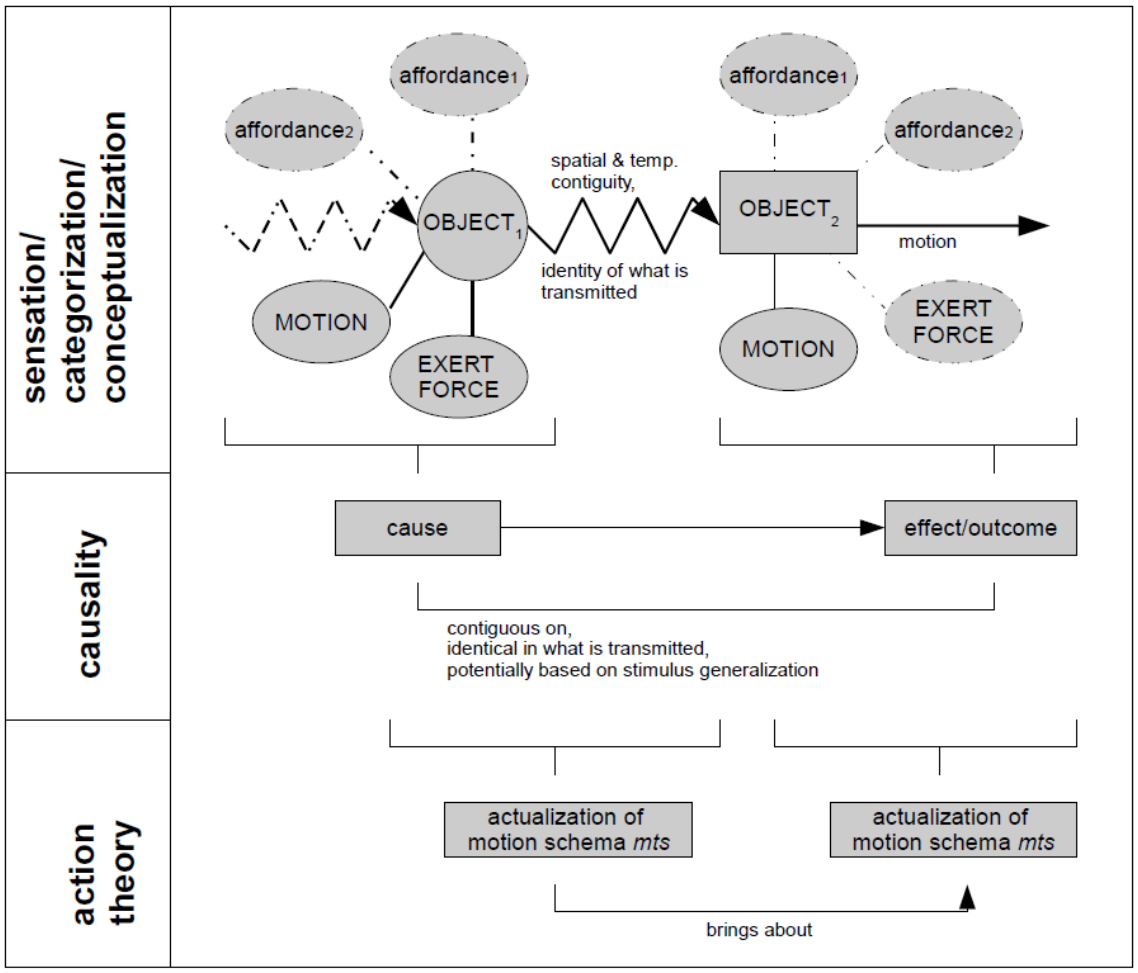


Figure 3.13: Cause attribution in identification/conceptualization with inanimate object

Consider an event, either perceived or freely conceptualized, for instance, a billard ball hitting another billiard ball such that the second billiard ball rolls across the pool table (billiard being a familiar example for discussions about causality; cf. Hume 1894: 28f., 1960: 164, Langacker [2]2002: 209ff., Dowe 2007). The first billiard ball is recognized as a single object ($OBJECT_1$, as a figure in sensation, depicted as circle). Its identified features (on the basis of salience and pertinence) restrict the range of states, processes, and activities in which the object may stand or occur, i.e., the states, processes, and activities which can actually be identified on the basis of the identification of a billiard ball. If the billiard ball cannot be identified due to the lack of a concept, its features are inferred on the basis of its overall

featural similarity with familiar objects (e.g., tennis or golf balls). If the event is freely conceptualized the features and affordances are simulated/re-enacted in the now familiar way. Anyway, the range of states, processes, and activities in which the object may stand is restricted because the billiard ball affords certain states, processes, and activities on the basis of its features. Note that its features are not depicted in the above Figure for the sake of simplicity. Affordances are given by ellipses. Among the many affordances of the billiard ball, two are actualized, namely MOTION and EXERT FORCE. Their actualization is indicated by the solid lines. Non-actualized affordances are indicated by dotted lines. Due to frequent past experiences with billiard balls, similar objects, or by inferring its features by analogy, the OBJECT_1 in question affords MOTION. Because it affords MOTION and not MOVEMENT, it cannot move by itself, but must already have received an impulse (indicated by the dotted zig-zag line to its left.) Now, the recognized motion and identified exertion of force are directed towards another billard ball (indicated by the zig-zag arrow leading to OBJECT_2). Because the perceiver/conceptualizer of this event "is" not the first billiard ball and cannot experience the exertion of force from one billiard ball to the other, he/she simulates it in the way described above (neural re-enaction of primal haptic experience of force). By doing this, he/she infers the causal relation, he/she does not sense it. What he/she senses is only spatial and temporal contiguity and identity of form of motion of the two objects (i.e., rolling, indicated by the straight arrow leaving OBJECT_2 to the right) and perhaps other clues indicating transmission of force (e.g., auditory stimuli). MOTION and EXERT FORCE as affordances of OBJECT_1 can only be actualized because OBJECT_2 "allows" this, i.e., it is "liable" of undergoing force (cf. White 2009a) in terms of mutual affordances. Now because both objects are identified/conceptualized as actualizing mutual affordances and because their relation is identified/conceptualized to be one of transmission of force, it is a relation in which the first object is the cause (or the first process consisting in OBJECT_1 moving, respectively) and the second object's motion is the effect, or outcome.

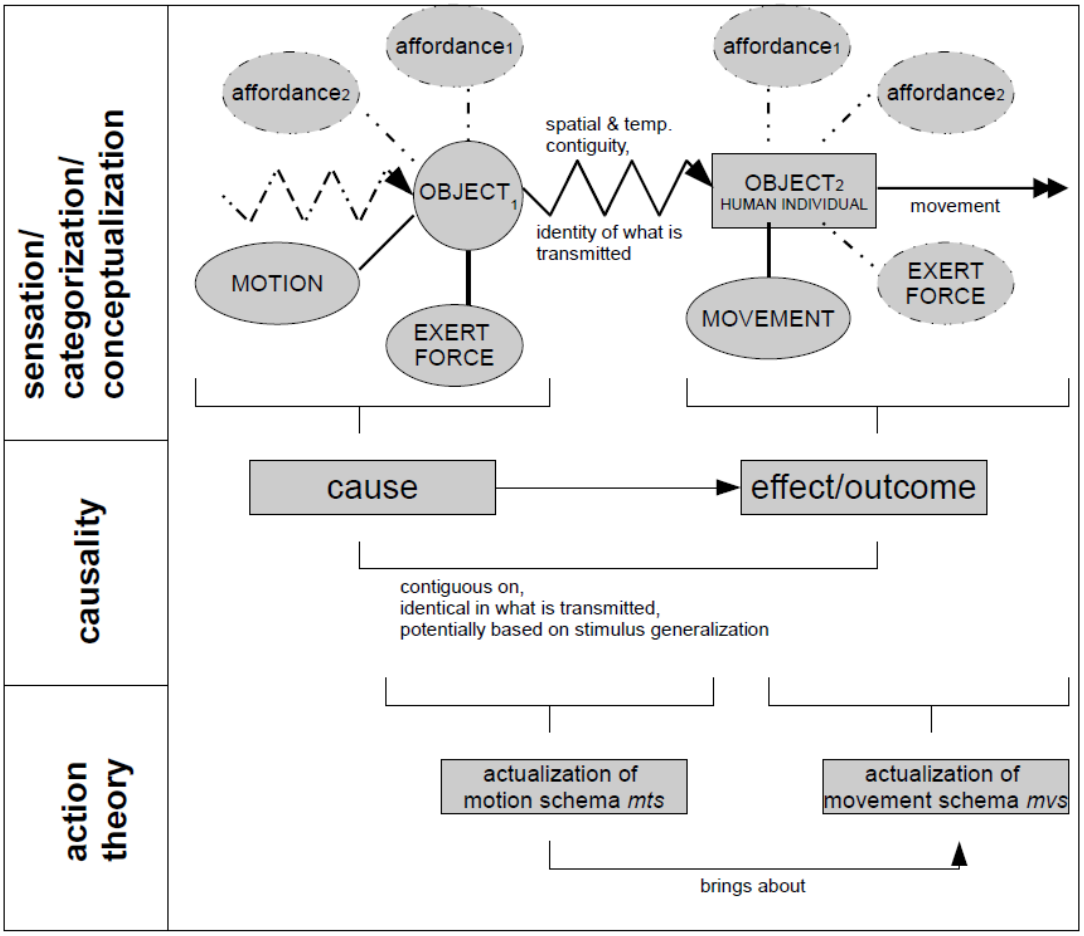


Figure 3.14: Cause attribution in identification/conceptualization with human individual

Now, imagine a door (OBJECT$_1$) pushing against a person (OBJECT$_2$), such that the latter stumbles away from it. The only difference between this type of event, as schematically depicted in Figure 3.14, and the type of event as depicted in Figure 3.13, lies in the character of OBJECT$_2$, i.e., its being human which makes the outcome, or result, of the instance of causation a movement, in this case most likely an instance of behavior (because the individual is unlikely to be made responsible for its being pushed). The dotted zig-zag arrow to the left of OBJECT$_1$ indicates that its motion is most likely to having been caused as well.

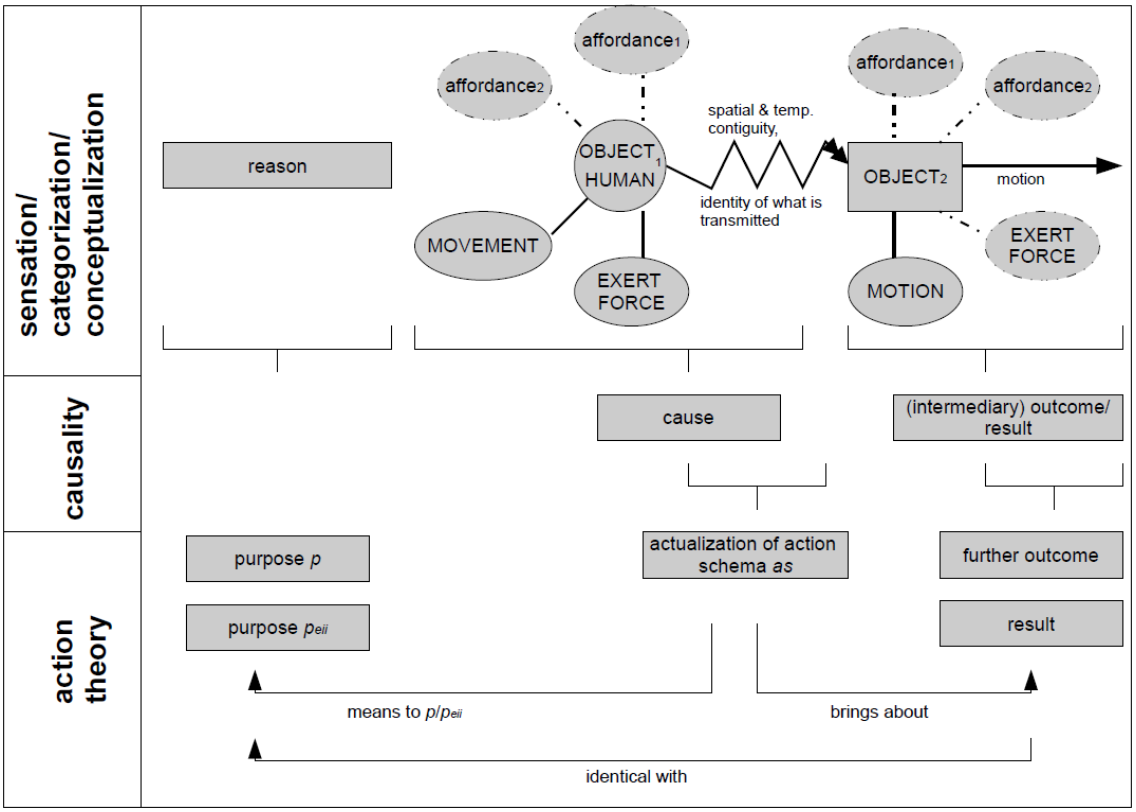


Figure 3.15: Reason attribution in identification/conceptualization

Figure 3.15 shows an instance of (identification/conceptualization of) causation as action, for instance, someone kicking a ball, and the ball rolling along a straight line afterwards. There is one main difference in causation as action in relation to causation as motion and behavior in the previous Figures. It is the absence of OBJECT_1's being forced to exert force itself, i.e., OBJECT_1 (a person) is attributed that he/she could have resisted from kicking the ball. Rather, these events are identified/conceptualized and attributed by an actor/cognizer to rest on purposes, i.e., the person (OBJECT_1) is attributed to want some circumstance to come about, for which he/she considers his/her act (exerting force on object_2) to be a means to put into effect. As such, the person's engagement is an instance of causation for the underlying movement schema to perform he/she had a reason (cf. also Hartmann 1996, Malle 1999, Janich 2001: 60).

There is one more case in which there is a reason present, while there is no cause in the sense defined above. This is given in Figure 3.16 below.

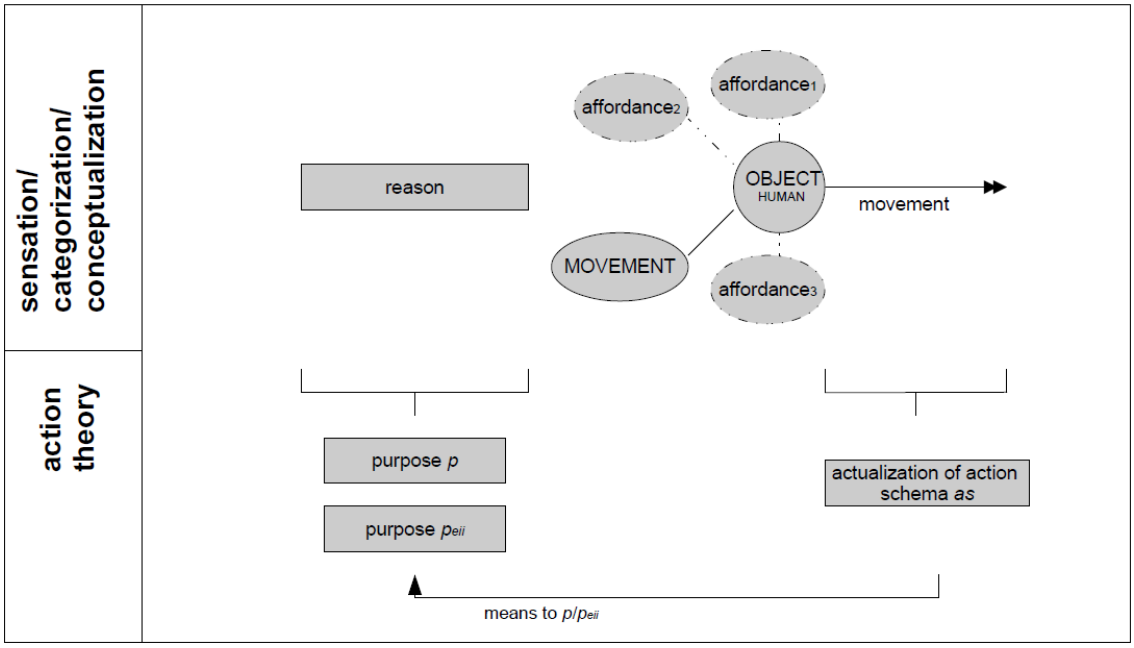


Figure 3.16: Reason and action

Figure 3.16 shows an instance of action in which no object except a human individual is identified or conceptualized. Examples for this would be someone running or swimming (actively). The idea of human action to be uncaused, and instead depending on reasons which take the form of purposes is simply presupposed in our everyday praxis which crucially is based on people's overtaking responsibility and attributing it to others for circumstances that have been brought about.

3.2.3 The significance of attribution for the linking competence

- We can now conclude the comprehensive sections on sensation, identification (further matters of conceptualization are yet to come), and on the various factors determining how a percept is "closed" by a perceiver (in the sense of the gestalt law of closure) by means of attribution, and evaluate the relevance of these cognitive psychological, sociological, and social psychological matters (from the species/community level of the research programmatic model) for the linking competence.

In the previous sections I have attempted to characterize what I have called "underspecification" of the percept, i.e., the output of sensation. In order to be able to act within and towards our environment and in accordance with practical concerns, the percept has been claimed to require closure, i.e., it must be closed in accordance with the corresponding (large-scale) gestalt law. I have tried to outline the most important parameters by which closure is attained under the headings of "attribution" and "judgment" as complementing identification and conceptualization. Furthermore, it has been argued that what is underspecified about the percept constitutes the interactional variables of a given verbal interaction. Thus, we can now summarize the parameters active in attribution which

constitute the interactional variables of a given verbal interaction. The determining, i.e., biasing factors (see Table 3.2) are the following:

- the actor/observer difference:
  It says that actors/cognizers assess circumstances differently depending on whether they are involved in them as actors (1st person) or observers (3rd person).
- the accomplishment/misaccomplishment difference:
  It says that actors/cognizers assess circumstances differently depending on whether they identify the circumstance (i.e., its result/outcome) as an accomplishment or misaccomplishment.
- the sympathy/antipathy, or one could say empathy, difference :
  It says that actors/cognizers assess circumstances differently depending on whether they feel sympathy or antipathy towards the person involved in them. (One can also conceive the crucial factor as empathy.)

The determined factors are the following, i.e., the actor/cognizer assessing a percept or concept is biased with respect to:

- whether the actor/cognizer assesses a circumstance to have been caused by stable dispositions of the involved person or by forces of the situation
- whether the actor/cognizer assesses a circumstance to have been brought about by accident (externally caused) or intention (reason)
- whether the actor/cognizer assesses the person having brought about a circumstance (i.e., its result/outcome) to deserve credit or blame

The way the percept is "closed" by the actor/cognizer is, as has been shown, mainly determined (or biased) by these factors captured by attribution theory in social psychology (cf. Moskowitz 2005, ch. 6, 7, 8, Smith and Mackie ^{2}2000, ch. 7, 8), complemented and brought together here by my own considerations. Where understanding some activity of someone is not immediately possible, these factors apply. Thus, where it is not possible to specify unanimously in accordance to some attributional praxis whether some movement (chain) happened as aiding some purpose, these factors determine how actor/cognizers' attribution will work out.
The attribution of cause and reason, credit and blame, the assessment of whether it is personal dispositions or situations which determine the coming about of states, processes, and activities, and whether, as a result, someone is attributed responsibility for what he/she has brought about depend on those constellations listed above and explicated in Table 3.3 below.[109] The determinants and determinates in attribution are those introduced in Table 3.2

[109] One factor which is related to those given in Table 3.3 but which is nevertheless qualitatively different from them is the nature of the addressee to which some conceptualized situation/event is communicated. This factor presumably does not influence the way in which a situation/event is identified or conceptualized but the way in which it is verbalized, namely in accordance or discordance with the expectations/desires/purposes of some addressee, and along some parameters related to the distribution of power.

and discussed in the sections following the statement concerning the underspecification of the percept. Table 3.3 below will be commented in turn.

scenario	**abbreviated relationship between factors**	**precise relationship**
A	actor/ accomplishment/ sympathy – disposition/ intention/ credit	If the perceiver and the causer are *identical* (high *empathy*, self-serving effort), the perceiver attributes *accomplishments* to his own *stable dispositions,* as having been brought about *intentionally,* and as *deserving credit. He* will thus *overtake the responsibility* for having brought about the resulting state/process/activity.
B	actor/ misaccomplishment/ sympathy – situation/ accident/ no blame	If the perceiver and the causer are *identical* (high *empathy*, self-serving effort), the perceiver attributes *misaccomplishments* to the *situation,* as having happened *accidentally,* and as *not deserving blame*. The causer will thus *avoid overtaking responsibility* of the resulting state/process/activity.
C	observer/ accomplishment/ sympathy – disposition/ intention/ credit	If the causer is the *3rd person* relative to the perceiver and if the latter feels *sympathy* towards the former, he attributes *accomplishments* to the other's *stable dispositions,* as having been brought about *intentionally,* and as *deserving credit*. He will thus *attribute the responsibility* for having brought about the resulting state/process/activity to the causer.
D	observer/ misaccomplishment/ sympathy – situation/ accident/ no blame	If the causer is the *3rd person* relative to the perceiver and if the latter feels *sympathy* towards the former, he attributes *misaccomplishments* to the *situation* and not to the person's stable dispositions, as having happened *accidentally*, and as *not deserving blame*. He will thus *avoid attributing* the *responsibility* for having brought about the resulting state/process/activity to the causer.
E	observer/ accomplishment/ antipathy – situation/ accident/ no credit	If the causer is the *3rd person* relative to the perceiver and if the latter feels *antipathy* towards the former, he attributes *accomplishments* to the *situation* and not to the person's stable dispositions, as having happened *accidentally*, and as *not deserving credit*. He will thus *avoid attributing the responsibility* for having brought about the resulting situation/event to the causer.

F	observer/ misaccomplishment/ antipathy – disposition/ intention/ blame	If the causer is the *3rd person* relative to the perceiver and if the latter feels *antipathy* towards the former, he attributes *misaccomplishments* to the person's *stable dispositions* and not to the situation, as having been brought about *intentionally*, and as *deserving blame*. He will thus attribute the *responsibility* for having brought about the resulting state/process/activity to the causer.
G	actor/ accomplishment/ antipathy – situation/ accident/ no credit	If the perceiver and the causer are *identical* and he is *self-critical* (self-concept withstanding), the perceiver attributes *accomplishments* to *the situation,* as having happened *accidentally*, and as *not deserving credit*. He thus he does *not claim/avoids overtaking responsibility* for having brought about the resulting state/process/activity.
H	actor/ misaccomplishment/ antipathy – disposition/ ? accident/ blame	If the perceiver and the causer are *identical* and he is *self-critical* (self-concept withstanding), the perceiver attributes *misaccomplishments* to his own *stable dispositions*, as having happened ? *accidentally,* and as *deserving blame.* He will thus overtake the responsibility for having brought abou the resulting state/process/ activity.

Table 3.3: Determinant parameters and determinate factors in attribution as part of identification/conceptualization

The column on the left shows the abbreviated setting of the identified determinants. In the first line one finds "actor/accomplishment/sympathy – disposition/reason/credit". The first three notions correspond to determining factors. The last three notions correspond to determined factors. That means that some actor/cognizer is the actor in this circumstance (and not the one observing another person), identifies his/her movement as accomplishment (and not as misaccomplishment), and sympathizes with him-/herself (instead of feeling antipathy towards him-/herself, i.e., distancing him-/herself from his/her own goals or means-end choice). This leads to some constellation of the determinate factors, such that it leads to a disposition attribution (the movement in question is identified to originate in some disposition of the self, not in some causing factor in the situation), to the attribution of intention/reason to the self (instead of identifying it to have happened accidentally, i.e., by external causation), and to the possibility of attributing oneself credit (instead of blame, or neither credit or blame). The other lines in the table can be read analogously.

If the processes depicted in Table 3.3 were the whole story, however, then the event as such (that what can be observed) was irrelevant for the judgment of whether this was an "agentive" or a "patientive" event. What must be taken into account is therefore the familiarity of the event in question, i.e., its typification or schematization and its eventual embeddedness in

action plans. A single activity, e.g., letting go of a milk carton such that it falls into the garbage can, receives different assessments depending on whether an observer knows that this is part of a whole chain of actions that belong to waste management and which requires organized interdependent action and participation of different persons. When a child experiences that "putting things into the garbage can" is repeatedly executed by their parents and finally results in the cleanness of the living environment such that there is space for everyday activities, which would be obstructed otherwise, then it will learn that each instance of this event is part of a plan of keeping the living environment clean.

Applying the socio-cognitive regularities captured in the scenarios in Table 3.3 to our introductory scenario (II.1) we find that for Jessica's utterance scenario F would be an explanation: Nicole, as the causer, is the third person relative to Jessica produces a misaccomplishment. If in addition Jessica felt antipathy towards Nicole, then her utterance which allows blaming her sister would be consistent.

In contrast, Sarah's utterance does not attribute responsibility to Nicole, so that blaming her is prohibited. The decisive criterion for her different attribution must lie in the sympathy/antipathy difference, since the other two factors are constant relative to Jessica's utterance. Assuming that Sarah, in opposition to Jessica, feels sympathy towards Nicole, it is perfectly predictable that she makes an utterance that exonerates Nicole from the responsibility for having knocked over the milk.

Before turning to some empirical evidence, it must be strongly emphasized that the parameters in Table 3.3 above are those identified for Western cultures. There is some evidence that the determining parameters are cross-culturally stable, while their determining potential varies cross-culturally, mainly along a Western-Eastern axis, as it seems (cf. Kunda [5]2002, ch. 11; Smith and Mackie [2]2000: 114ff., 127f., 311f.; Moskowitz 2005: 37f., 117f., 303f.). Further research is without question necessary and desirable here.

3.2.4 Case study: Attribution in precarious events

I will now present some results from a research project that illustrate how the attributional mechanisms outlined above are supposed to work. By the word "precarious" in the title of this section I mean exactly those events whose percepts are underspecified and where people will not unanimously attribute responsibility or not. For instance, someone pulling a friend out of a swamp will always be attributed the responsibility for having done this. In contrast, someone breaking a glass will be attributed responsibility only under certain conditions the parameter settings of which are the topic of this study.

3.2.4.1 The research project "Syntax of Hessian Dialects (SyHD)"

The research project Syntax of Hessian Dialects (SyHD) in which my own study is embedded aims to investigate, document, and analyze the syntax of the dialects spoken in Hesse, which dialectally is presumably the most heterogenous federal state in Germany. Methodically, the project is inspired by the indirect methods of the "Syntactic Atlas of Swiss German Dialects (SADS)" and the "Syntactic Atlas of the Dutch Dialects (SAND)" but has developed them further (cf. Fleischer, Kasper & Lenz 2012). In its first phase an indirect method – posting

questionnaires – was employed, in its second phase direct explorations will be used. The present study stems from the first phase.
A grid consisting of approximately 165 squares was laid over Hesse. In each of these squares we found a village of about 500 to 1500 inhabitants, in each of which we found three to ten dialect speakers. The informants are so-called non-mobile, older rural males and females (NORMS and NORFS; cf. Chambers & Trudgill [2]1998: 29–31). These sociolinguistic parameters increase the probability that speakers will be competent in their local dialects.
From a cognitive-psychological perspective it seemed necessary to present the stimuli in the questionnaire tasks in a written dialectal form: We know that nearly all German dialect speakers have competence not only in their dialect but also in a variety close to spoken Standard German, which they "activate" depending on the situation (Lenz 2003, Schmidt & Herrgen 2011). Giving them Standard German stimuli would therefore have resulted in "tapping" their Standard competence. We know that there are about 17 dialect regions in Hesse, based on phonological factors. Therefore, the stimuli in each questionnaire were translated into the dialects of these 17 regions. From a linguistic perspective, one version per village would have been the ideal solution, but from a logistical perspective, the 17 existing versions are what could actually be accomplished. Figure 3.17 gives an example of a task from a SyHD questionnaire in a dialectal form[110] (for details on the various question types employed and on the technique of "dialectalizing" Standard German stimuli see Fleischer, Kasper & Lenz 2012).

13. Markus, son of Bruno, already had some girlfriends in the past, but never anything serious. Bruno gets worried about this and says: Markus, der Sohn von Bruno, hat zwar schon ein paar Freundinnen gehabt, aber noch nie war es etwas wirklich Ernsthaftes. Bruno ist darüber langsam besorgt und meint:

→ *Please place a checkmark next to the sentences you can say in your dialect* (multiple answers are permitted).

a) ☐ Also eich waaß net, ob er emol will heirode.
Well I.1NOM know.3 NEG if he.3NOM sometime want.3 marry
'Well, I don't know, if he wants to marry, anyway.'

b) ☐ Also eich waaß net, ob er emol heirode will.
Well I.1NOM know.3 NEG if he.3NOM sometime marry want.3
'Well, I don't know, if he wants to marry, anyway.'

→ *Would you usually say this sentence in a form that is not mentioned?*
If so,please write down the sentence as you would usually say it:

c).....

→ *Which sentence is the most natural for you?*

a) ☐ , b) ☐ or c) ☐

Figure 3.17: A question from a SyHD questionnaire

[110] Here: the dialect spoken in the transition zone between Central Hessian and Moselle-Franconian.

In this type of grammaticality/acceptability judgment task (one of several task types employed) there is always a brief description of a situation or event at the top. This description serves to give some background information about the contents in the sentences to be judged ((a) and (b) in Figure 3.17), to introduce some discourse referents, and to determine an information structure for the sentences to be judged. It also serves to embed these sentences into a type of discourse informants are familiar with from their lifeworlds. Informants are then asked to place a checkmark next to the sentences they can say in their dialects. The following sentences are then given in lay dialect notation (since there are no conventionalized orthographic systems for dialects). If informants want to give a response that does not match (a) or (b), they can insert it above the dotted lines ((c) in Figure 3.17). Finally, they are asked to determine the sentence which is the most natural for them in the given context. Informants have the opportunity here to mark their own sentence, too.
With respect to attribution tasks, my hypothesis was the following:

- Given some description of a precarious event and two possible verbalizations of that event, one of which suggests an interpretation by its form where the causer in the event is attributed responsibility, and one of which suggests an interpretation by its form where the attribution of responsibility to the causer is prohibited,
- then modulating the determining factors in attribution in accordance to the scenarios in Table 3.3 leads to preferences in informants for the sentence with the responsibility attribution predicted by that scenario. Because matters of attributional praxes are important here and because the investigated area can be identified as a small part of a huge, homogenous sociocultural area (tentatively: Western Europe)[111], no areal variation in preferences is expected despite considerable linguistic^{o} differences in the dialects investigated.

This can be exemplified by means of the following question that has actually been used in the SyHD questionnaire. In all, I will demonstrate this by means of three of the scenarios from Table 3.3.

3.2.4.2 Scenario D

The question below is completely translated into English here except for the stimuli which are given in Standard German (a selection of the original, dialectal variants of the question can be found in Appendix B). I have added boldface to the phrases in the event description at the top of the question for reasons outlined in turn.

> 7. You borrowed several glasses from a friend for a family celebration. During the party **one of the glasses gets broken** by **your father Willi who is sick with the flu**. When you return the glasses to your friend, you say:

[111] See references cited at the end of section 3.2.3.

→ *Please place a checkmark next to the sentences you can say in your dialect* (multiple answers are permitted).

a) ☐ Der Willi hat eins von deinen Gläsern runtergeworfen.
DET.NOM Willi has.3 one.ACC of your.DAT glasses.DAT down-throw.PTCP
'Willi knocked over one of your glasses.'

b) ☐ Dem Willi ist eins von deinen Gläsern runtergefallen.
DET.DAT Willi is.3 one.NOM of your.DAT glasses.DAT down-fall.PTCP
'(It happened to Willi that) one of your glasses broke.'

→ *Would you usually say this sentence in a form that is not mentioned?*
If so,please write down the sentence as you would usually say it:

c)…….

→ *Which sentence is the most natural for you?*

a) ☐ , b) ☐ or c) ☐

Figure 3.18: Attribution task 1 from SyHD questionnaire

The precarious event in question consists of breaking a glass here. There are contexts conceivable in which breaking glasses constitutes action, i.e., in which the causer could desist from breaking them, but in most contexts breaking glasses is conceived of as accidental behavior, not as action. That means it is not possible to decide on the basis of having perceived that event (here: having read the description of the event above the dialect sentences) whether the causer is to be made responsible or not because the description (percept) of the event does not specify intentions or absence of intentions. Grammatically, the sentences differ in that the (a) variant is the causative variant of the (b) variant. However, in German, anticausative constructions as in (b) need not suppress the causer but may verbalize it by means of a dative complement which is the case here. The boldface in the event descriptions illustrates how the determining factors in attribution are built in and modulated here. They are supposed to manipulate the attribution performance of the informants:

- The actor/observer difference is built in by means of the specification that it is a third person – Willi – which is involved here.
- The accomplishment/misaccomplishment difference is built in by means of the specification that the event in question consists of breaking a drinking glass at a party (usually a misaccomplishment).
- The sympathy/antipathy or empathy difference is specified by construing Willi as the father of the cognizer who is also sick with the flu, thus triggering empathy.

This scenario corresponds to the parameter setting in scenario D in Table 3.3. In this way, scenario D is built into this description. According to the mechanisms in attribution the setting of the determining factors should lead the cognizer (i.e., the informant) to attribute Willi's deed

- to forces of the situation,
- as having happened accidentally by external causes,
- and that Willi is not to blame for this.

As a result, the cognizer should conclude that the causer cannot be made responsible for the circumstance he has brought about. This in turn is predicted to show up in the preference of the informants for a syntactic construction which does not suggest the agentive but the "patientive" involvement of the causer.

- Sentence (a) in Figure 3.18 allows, or even suggests, an agentive interpretation of the causer.[112]
- Sentence (b) in Figure 3.18 disallows an agentive interpretation of the causer.

As a consequence, informants should prefer sentence (b). The results are given below:[113]

dialect region / construction	averaged across 14 dialect regions	standard deviation across dialect regions
a) agentive	24,07%	6,28%
b) patientive	73,68%	6,47%
deviant	2,12%	2,43%
N = 694		

Table 3.4: Results for SyHD question corresponding to scenario D[114]

The results confirm the hypothesis.

3.2.4.3 Scenario B

The question below is again translated into English here except for the stimuli which are given in Standard German.

> 25. While your daughter and son-in-law are on holiday, **you** are taking care of their houseplants. While checking their apartment, **you bump against your son-in-law's biggest trophy**. It falls down and breaks. When the vacationers come back, you say to your son-in-law:

[112] Why these sentences allow or suggest particular readings but not others is the topic of chapter 4.
[113] The most natural variants were counted. Where no most natural variant(s) were given, the checked boxes in the upper part of the task were counted, i.e., responses to the question at the bottom of Figure 3.15. Deviant responses are those that could not be classified as instances of the (a) or (b) types. For instance, if informants prefered another verb in the (a) variant and wrote this down under (c), and if this verb is substitutable with that in the (a) variant syntactically and thematically, then (c) was classified as an instance of (a).
[114] A list of the dialect regions can be found in Appendix B. For further details see the SyHD homepage (www.syhd.info), Fleischer, Kasper & Lenz 2012, Kasper (under review).

→ *Please place a checkmark next to the sentences you can say in your dialect* (multiple answers are permitted).

a) ☐ Ich habe deinen Pokal runtergeworfen.
I.1NOM have.1AUX your.ACC trophy down-throw.PTCP
'I knocked over your trophy.'

b) ☐ Mir ist dein Pokal runtergefallen.
Me.DAT be.3AUX your.3NOM trophy down-fall.PTCP
'(It happened to me that) your trophy broke.'

→ *Would you usually say this sentence in a form that is not mentioned?*
If so,please write down the sentence as you would usually say it:

c).....

→ *Which sentence is the most natural for you?*
a) ☐ , b) ☐ or c) ☐

Figure 3.19: Attribution task 2 from SyHD questionnaire

The precarious event in question consists in causing a trophy to break. There are contexts conceivable in which breaking trophies constitutes action, i.e., in which the causer can desist from breaking them, but in most contexts breaking goblets is conceived of as accidental behavior, not as action. That means it is not possible to decide on the basis of having perceived that event whether the causer is to be made responsible or not. The event descriptions leave that unspecified. Grammatically, the sentences differ again in that the (a) variant is the causative variant of the (b) variant again, but nevertheless (b) contains a causer complement. The boldface in the event descriptions illustrates how the determining factors in attribution are modulated here. They are supposed to manipulate the attribution performance of the informants:

- The actor/observer difference is built in by means of the specification that the causer – the addressed person – is identical to the observer.
- The accomplishment/misaccomplishment difference is built in by means of the specification that the event in question consists in breaking someone's trophy.
- The sympathy/antipathy or empathy difference is not separately specified but it is assumed as the standard case that the causer is sympathetic with himself.

This scenario corresponds to the parameter setting in scenario B in Table 3.3. In this way, scenario B is built into this description. According to the mechanisms in attribution the setting of the determining factors should lead the cognizer (i.e., the informant) to attribute his own (imagined) deed

- to forces of the situation,
- as having happened accidentally by external causes,

- and that he/she cannot be blamed for this.

As a result, the cognizer should conclude that he/she cannot be made responsible for the circumstance he/she has brought about. This in turn is predicted to show up in his/her preference for a syntactic construction which does not suggest his/her "agentive" but his/her patientive involvement in the event.

- Sentence (a) in Figure 3.19 allows, or even suggests, an agentive interpretation of the causer.
- Sentence (b) in Figure 3.19 disallows an agentive interpretation of the causer.

As a consequence, informants should prefer sentence (b). The results are given below:

dialect region construction	averaged across 14 dialect regions	standard deviation across dialect regions
a) agentive	27,72%	10,47%
b) patientive	70,94%	10,47%
deviant	0,66%	0,97%
N = 681		

Table 3.5: Results for SyHD question corresponding to scenario B

The results are nearly identical to those of scenario D and confirm the hypothesis.

3.2.4.4 Scenario F

The Figure below again contains a SyHD question translated into English. The stimuli are given in Standard German and are annotated.

13. **Tilers** have been working in your house for **two weeks** in order to re-tile your bathroom. When the tilers are gone and it is **quiet again**, you notice that a **piece is broken off the sink**. You tell your husband:

→ *Please place a checkmark next to the sentences you can say in your dialect* (multiple answers are permitted).

a) ☐ Die Handwerker haben das Waschbecken kaputt gemacht.
The.3NOM.PL tiler.PL have.3PL.AUX the.ACC sink broken-make.PTCP
'The tilers broke the sink.'

b) ☐ Den Handwerkern ist das Waschbecken kaputt gegangen.
The.DAT.PL tiler.DAT.PL be.3SG.AUX the.3SG.NOM sink broken-go.PTCP
'(It happened to the tilers that) the sink broke.'

→ *Would you usually say this sentence in a form that is not mentioned?*
If so,please write down the sentence as you would usually say it:

c).....

→ *Which sentence is the most natural for you?*

a) ☐ , b) ☐ oder c) ☐

Figure 3.20: Attribution task 3 from SyHD questionnaire

The precarious event in question consists in breaking a piece off a sink. There are cultural contexts – e.g., tearing down houses – in which breaking sinks constitutes action, i.e., the causer can desist from breaking them, but in most contexts breaking sinks is conceived of as accidental behavior, not as action. That means it is not possible to decide on the basis of having perceived that event whether the causer is to be made responsible or not. The event descriptions leave any clues with respect to agentivity unspecified. Grammatically, the sentences differ in that the (a) variant is again the causative variant of the (b) variant, but where (b) contains a causer complement in the dative. The boldface in the event descriptions illustrates how the determining factors in attribution are modulated here. They are supposed to manipulate the attribution performance of the informants:

- The actor/observer difference is built in by means of the specification that the causer – the tilers – is someone different from the observer.
- The accomplishment/misaccomplishment difference is built in by means of the specification that the event in question consists in breaking someone's sink.
- The sympathy/antipathy or empathy difference is built in by means of the specification that the time of working in the house was long and noisy, which should have taxed the patience of the persons concerned, causing feelings of antipathy (or low sympathy/empathy).

This scenario corresponds to the parameter setting in scenario F in Table 3.3. In this way, scenario F is built into this description. According to the mechanisms in attribution the setting of the determining factors should lead the cognizer (i.e., the informant) to attribute the tilers' deed

- to stable dispositions,
- as having been brought about intentionally,
- and that they can be blamed for their deed.

As a result, the cognizer should conclude that he/she can make the tilers responsible for what they have brought about. This in turn is predicted to show up in his/her preference for a syntactic construction which suggests their "agentive" involvement in the event.

- Sentence (a) in Figure 3.20 allows, or even suggests, an agentive interpretation of the causer.
- Sentence (b) in Figure 3.20 disallows an agentive interpretation of the causer.

As a consequence, informants should prefer sentence (a). The results are given below:

dialect region construction	averaged across 14 dialect regions	standard deviation across dialect regions
a) agentive	75,54%	10,26%
b) patientive	22,44%	9,53%
deviant	2,02%	3,82%
N = 557		

Table 3.6: Results for SyHD question corresponding to scenario B

The results confirm the hypothesis.

3.2.4.5 Evaluation

The simulated percepts underlying the events described in the SyHD questions above – as well as in the fictional introductory scenario (II.1) – lack information about external causes and other physical properties and relations, they lack information about the wider context of the event, the potential presence or absence of purposes in the causer, and potential stable dispositions of him/her or situational forces on him/her. In sum, they are underspecified exactly with respect to those matters outlined in section 3.1.4. Specifying what is underspecified about these circumstances is entirely left to the actor/cognizer (the SyHD informants) in terms of attribution which makes use of the determining and determined factors uncovered in the sections on salience, pertinence, causation, but especially in the sections on the self-serving actor/cognizer who falls victim to inaccurate socio-cognitive rules of thumb, and on the ascriptivistic action concept. On the other hand, sentences (a) and (b) in each of the above scenarios are means to verbalize the events in the scenarios in ways that imply some statements with respect to what is actually underspecified about these events. The sentence pairs are therefore different strategies of externalizing originally internal attributions by means of verbal utterances. For someone who accepts the (a) sentences as attributions about what the respective events in the scenarios describe it is possible (and appropriate from an attributional perspective) to reward or reprimand the involved persons. The syntactic structures of the (a) sentences allow, or even suggest the rather agentive involvement of the referents of their nominative complements. In contrast, for someone who accepts the (b) sentences it is inappropriate (though not impossible) to reward or reprimand the involved persons – it would count as performative inconsistency. One cannot, or actually ought not, accept a sentence of the (b) form, the syntactic structure of which prohibits an agentive reading, and then honestly reward or reprimand the person in question. This is because

accepting (a) means attributing the responsibility for having brought about the critical event to the involved person. The (b) sentences, on the other hand, exonerate the persons from this responsibility. What it is exactly in the structures of the (a) and (b) sentences in the above scenarios that makes these attributions but not others possible is the topic of part III.

One can state already at this point, however, that there must be more to the semantics of utterances than – literally – meets the eye. A single event might underlie both (a) and (b) sentences in each of the above scenarios, i.e., two actors/cognizers perceiving a single event might be led to different attributions and to uttering (a) and (b) respectively, only on the basis of the determining factors in attribution.

In fact, this is my central thesis for which the scene in (II.1) with Nicole and the milk carton stands. It makes clear why describing the semantic part of the linking competence must not rely on an objectivistic semantic theory. When the linguist who models the competence of a native speaker specifies the argument structure of a predicate (e.g. *play* [x=agent, y=patient]), he/she acts as if the thematic status of persons (here: 'x') in circumstances (here: 'play'), or as we could say the factors governing the attribution of responsibility to them, were simply given, could definitively be characterized, or could simply be drawn from what can be perceived. Chapter 3 up this point should serve to show that in doing so one falls victim to naïve realism, too. Characterizing the linking competence means characterizing an imperfect actor/cognizer. Subscribing to the assumption that syntactic matters are at least in part shaped by semantic matters must therefore take into account exactly this kind of actor/cognizer.

Behind the theoretical metaphor of thematic role assignments of actors/cognizers to persons in circumstances they perceive lies a complex machinery of attribution which cannot go unquestioned in theories of the linking competence of the same actors/cognizers.

Two questions about the present study shall be discussed briefly before turning to the next sections. Firstly, why are there not stronger, or even categorical, preferences for the predicted sentences and where does variation in the degree of preference across regions come from, as indicated by standard deviations? I think it is unquestionable that we – and the SyHD informants – are dealing here with quite subtle semantic matters. A unanimous preference for the predicted sentences would thus be rather surprising. The actual results demonstrate a quite consistent preference for the predicted sentences. At the same time, the subtlety of theses semantic matters comes along with the violability of their preferences. That means if there are less subtle differentiations to be judged, then rather the attributional preference is violated than, for instance, a "harder" formal constraint. If, for instance, some (a) variant is the attributionally preferred one but includes a particle before the verb that is rare or unusual in the respective dialect region, informants may choose the (b) variant for these formal reasons, although from a semantic (attributional) perspective (a) would be preferable. For a related reason, only 14 of 17 regions have been included in the results (see Appendix B): In the three remaining regions there are partial dative/accusative syncretisms with only accusative forms preserved. The (b) sentences contain datives, thus the informants unfamiliar with the dative in

their dialects would have to reject the (b) variants for formal reasons despite their presumed preference for the (b) variants in semantic (attributional) terms.
The second question concerns the person talked to in the event descriptions (scenario D: friend, scenario B: son-in-law, scenario F: husband): Is it not possible that the preferred sentence and thus the underlying attribution is co-determined by the power structure between the cognizer and the person talked to? For instance, if the cognizer was afraid of suffering penalty from his/her interloctor because of honestly uttering (a) or (b), then he/she could eventually switch to the sentence which is presumably the preferred one by the interlocutor. Because of that I have tried to hold the power structure between the cognizer and the person talked to relatively constant.
Summing up, the previous sections should serve to doubly ground our task-related cognitive activities, namely in perception and action/sociocultural praxis. Whatever the principles are that are operative between specific phonological strings and specific conceptual contents and attributions in specific circumstances, it is conceptual structure and attribution and how they work which determines how a linking theory should be described. Roughly speaking, a theory about the competence of linking utterances on the one hand and concepts and attributions on the other hand requires a cognitive theory that is psychologically plausible, since reference to cognitive activities is the only way to answer the question of what is coded by syntactic structures. This is the primary reason why so much space is dedicated here to grounding the semantic part of the linking competence. Grounding part of semantics in sociocultural praxis, attribution in particular, was the topic of the preceding sections. Next I will demonstrate how spatial-conceptual and temporal-conceptual matters are systematically related to the syntactic structures found by linguists.
A last note concerns the notion of "agentivity" used above in a pre-theoretical manner: What varies in scenarios A–H above is apparently the "agentivity" of the person involved in the described event as conceptualized in a top-down manner by the actor/cognizer. What follows from this is firstly that especially the much discussed concept of agentivity can be derived from the factors underlying attribution in the present framework. Secondly, agentivity transpires as a notion that has no objective basis but one entirely originating in sociocultural praxes and constituted by attribution performances. By lack of an objective basis I mean the fact that agentivity – taking the form of attributed responsibility – is not present in the percepts of the states, processes, and activities we encounter but instead that it is imposed onto them. Where a person attributed responsibility is also identified to be a causer, a perceptual notion comes into play. A responsible causer, as a special type of agent then, seems to have a special role in language comprehension (see section 4.2). I have tried to show that one can only do justice to the notion of agentivity, if it is based on perceptual and actional considerations.[115] In section 2.1.2 I expressed reservations against CFL's "Generalization Commitment" (CFL A2) and "Cognitive Commitment" (CFL A3) because they focus on individual cognition only. One can state now more properly that the mechanisms underlying attribution are not matters of individual cognition alone. Attribution of responsibility is a

[115] The notion of agentivity proposed here seems to fit the RRG notion of agentivity best, where an animate causer ("effector") is interpreted as an agent, by means of pragmatic implicature (van Valin & Wilkins 1996, Holisky 1987). Other interpretations of agentivity can be found, for instance, in Dowty 1991, Primus 1999, Ackerman & Moore 2001, Grimm 2005, Fillmore 1968, Gruber 1970, Jackendoff 1990, Grimshaw 1990, Culicover & Wilkins 1986.

socioculturally determined all-or-nothing matter and does not show the properties many individual cognitive matters show, e.g., the prototype structure of concepts.

- With respect to the model underlying the research programme pursued here, the multidisciplinary sections can be concluded now. In the forthcoming chapters the perceptual, conceptual, and actional notions of the linking competence discussed at the species/community level of the model will be systematically related to linguistic^{o} structures. I will outline the principal mechanisms governing their relationship. This means moving away from the sub-competences closer towards the linking competence in the narrow sense.

3.3 The conceptualization of spatial relations and their coding in language

In the previous sections sensation (which is completed by recognition) and identification/conceptualization have been differentiated. Then, aspects of identifying and conceptualizing states, processes, and activities were characterized that are not contained in the (mostly visual) percepts because they are not perceivable. Rather, these non-conceptual contents must be imposed on percepts/concepts in a top-down manner by means of attribution. It includes physical and especially causal knowledge, knowledge about causes and reasons, shortcomings of actors/cognizers and others, culminating in an attribution theory. The notions employed in this attribution theory originate in the ways people live and act together in their particular communities, for instance, the conditions under which cause and reason are attributed, or in what ways object affordances are exploited for the sake of specific actions. These sections should serve to point out the socioculturally determined character of our conceptualizations and attributions, i.e., our grasp of circumstances around us beyond what is given to our senses. At the same time, it is these socio-cognitive notions which are usually not taken into consideration in theories dealing with the conceptualizations underlying verbal utterances. Rather, the relationship between concepts as symbolized by language and states of affairs in the world are often assumed to be much simpler. Generalizing considerably, Johnson (1987), Lakoff (1987), and Lakoff & Johnson (1999) call those theories of meaning "objectivistic" which define meaning as constituted by the correspondence between states of affairs in the world on the one hand, and propositions underlying verbal utterances or conceptualizations on the other hand. I have tried to point out, however, that it is epistemologically highly problematic to conceive of states of affairs in the world and the conceptual activities of people as existing independently of each other in self-contained realms, or to conceive of the circumstances around us as being intelligible without further ado. Such a view fails to take into consideration our physical makeup as well as sociocultural constraints which are essential to the constructive nature of our conceptual and actional knowledge. From the culturalist and constructivist perspective on epistemology taken here, it is simply improper to treat notions like agentivity and reasons in an objectivistic way as somehow contained in the world we perceive.

This does not mean, however, that the states, processes, and activities we observe and deal with cognitively did not take place in space and time. Although the question as to whether

someone broke a vase accidentally or intentionally might not be answerable by recourse to the actor/cognizer's sensation alone, he/she nevertheless makes a statement about some state of affairs in the world once he/she verbalizes his/her conceptualization. In other words, although actional notions might not be "visible", they nevertheless "operate" on conceptualizations of states, processes, and activities that have some position in space and time. However, space and time are not things, but, as in the case of the mind, they are – as "space" and "time" – termini of reflection. As such, they are a practical means for reasoning (which I take to be simulated speech; cf. Hartmann 1998: 168–176) talking about the relation of things to other things, or the continuity, change, necessity, or the (im)possibility of a relation between things in general, i.e., independent of specific instances of relations. Relations between things are sensed in terms of figure/ground configurations (see section 3.1.3). So, figure and ground are also termini of reflection in the first instance. In the concrete event of sensation it is always a specific object that is segregated in relation to what else is there. In talking about these matters of sensation independently of particular sensations, we term the object that is segregated in relation to some other thing "figure" and the latter "ground". Bearing this in mind, we can state that all the processes summarized under "closure of the percept" and "attribution" operate on percepts made up of spatial figure/ground configurations relative to points in time. Spatial relations in the context of sensation were the topic of earlier sections. Since we are still dealing with conceptual structures here, we will now turn to the identification and conceptualization of spatial relations. The discussion will again build on the assumption that conceptualization is simulated perception (and/or action). But in contrast to the characterization of actional matters in identification (i.e., the mechanisms underlying attribution) – which do not have counterparts in percepts, as has been shown – the conceptualization of spatial relations can be seen quite analogously to the sensation of spatial relations.

In other words, because conceptualization is simulated perception, the integral parts of the conceptualization of spatial relations have counterparts in sensation (cf. Langacker 2000, ch. 7).

- Section 3.3 is structured as follows: I will characterize the significance and the integral parts of the conceptualization of spatial relations and the basic mechanisms as to how they are coded in language. Two global modes of coding will be identified in this context, namely motivation and exploitation. This is indicated in the partial research-programmatic model given in Figure 3.21. I will also discuss the acquisition of motivated and exploiting conceptualization-syntactic structure mappings and show how the conceptualization of circumstance types can be captured by means of the notion of constructions. This procedure thus utilizes notions from the perceptual psychological and social psychological parts – circumstance perception, conceptualization, and attribution – of the research programmatic model and outlines the mechanisms by which they are

related to the use of syntactic structures, thus approaching the linking competence step by step.

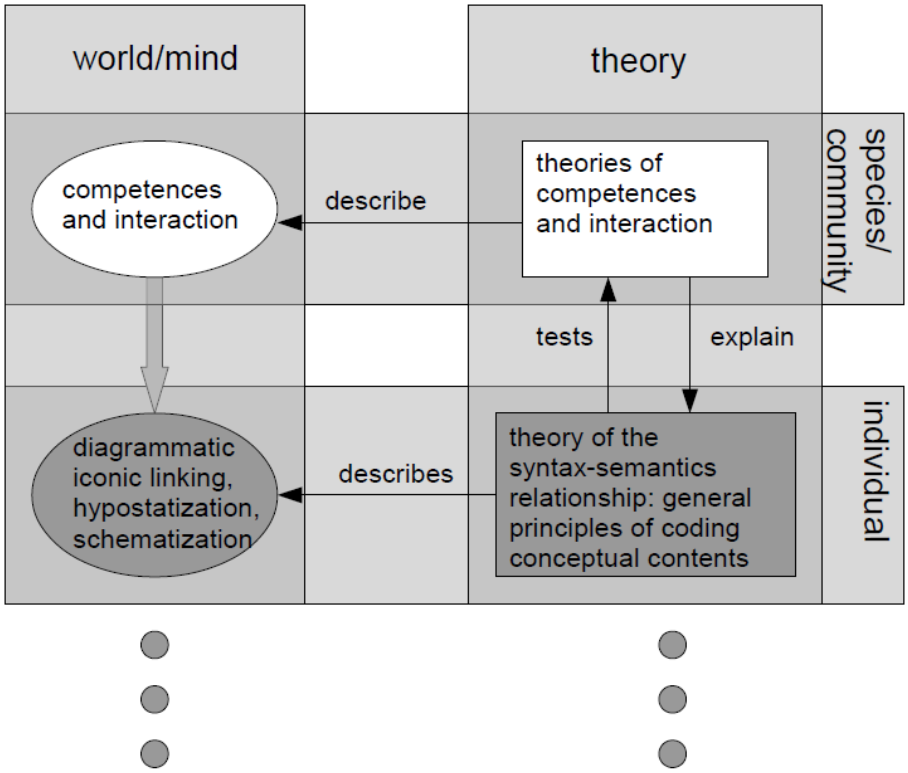


Figure 3.21: Diagrammatic iconic linking, hypostatization, and schematization as sub-competences of the linking competence that are developed in section 3.3

3.3.1 The significance of spatial relation conceptualization and coding

Above, conceptualization has been defined as simulated perception (and/or action). We have seen that in the case of vision there are groups of neurons which are sensitive toward specific features of stimuli but not to others. The features of the things in the visual field co-determine what is singled out as a figure in sensation. It has also been shown that what a figure is is also necessarily co-determined by that against which it is singled out – the ground. In addition, figure/ground segregation in sensation has been shown to occur without attention most of the time.

Now, structuring the visual field by means of figure/ground segregation is of great importance for language (cf. Talmy 2000, I, 5).

However, when talking about linguistic[o] structures, attention plays a different role than in vision. In verbally communicating something perceived we can only verbalize those states, processes, and activities we have attended to. "Objects that are not consciously processed are neither recognized nor stored for future recall." (Bertenthal 1996: 434; I take this statement to also hold true for circumstances; see section 3.5 on the relation between objects and circumstances). Future recall would be necessary for communication, however. In what ways are figure and ground important for language? As an example, speakers avoid (in most but not

all contexts) utterances like *the building is in front of the car* in favour of *the car is behind the building*. Now, Talmy (2000, I, 5) has shown that in verbalizing such (even metaphorical) relations of location or motion/movement, the syntactic structure of the utterance (here: NP-V-P-NP) seems to "respect" or to a certain degree "reflect" perceptual figure/ground segregation. In Talmy's terms, the building would have been conceptualized as figure in the first sentence and as ground in the second by the speaker and hearer, respectively. Both sentences are grammatically well-formed but the first one seems inappropriate because of its association of figure and ground with certain syntactic constituents in the syntactic structure. Remember the gestalt laws: An object is figure-apt, if it is mainly small and movable relative to a ground. It is the car and not the building which appears small and movable in this example.
In addition, it is not only possible but crucial in verbal communication that a speaker is able to describe some (visual) perceptual experience of a state, process, or activity he/she had to someone who did not perceive it himself, e.g., *Alex fell off his bike today in front of the institute*. The addressee thus has not perceived the event and therefore has not attended to it in the way the speaker has; he/she did not have the vantage point the speaker had and so on.

However, the internal organization of the speaker's utterance is something like an instruction for the hearer to conceptualize the event the speaker has described to him/her verbally, because it consists of that to which the speaker has attended in this circumstance, or what has been pertinent to him/her about this event. Although this does not provide the addressee with the same visual experience, it allows him/her to imagine or conceptualize this event in a way that can be described as a simulation of the speaker's visual perceptual experience.[116] Because of this rationale, I will call the theory developed here "Instruction Grammar".

We are dealing here with the questions of how the structure of what to convey can be described (percepts and concepts), how the structure of the symbolic device can be described (syntax), and, most importantly, how the relationship between both can be described (linking). In this subsection I make the claim that this relationship is not arbitrary.

In particular I claim that parts of speech in the syntactic constructions underlying utterances (as identified by linguists) are arranged in a systematic way that allows interpreters to (re-) construct from those constructions figure/ground configurations in order to be able to conceptualize states, processes, and activities for the sake of several praxis-relevant reasons.[117]

This means claiming a tight, motivated relationship between syntax and conceptualization. If it is a valid proposal that linguistic^{o} structures respect, or in some way reflect, figure/ground configurations, this means that figure and ground can be decoupled from actual (visual)

[116] Cf. Spivey et al. (2002), Spivey, Richardson & Gonzalez-Marquez (2005); there may also be a (partial) simulation of the activity itself there, eventually. This has already been discussed here along the lines of neuronal re-enactment outlined in section 3.2.1; on this aspect see also McWhinney (2005).
[117] In the introduction to chapter 2 I have characterized language as organizing praxes and at the same time as being constitutive of praxes. Language use was characterized as action. Taken together, local verbal interaction serves mostly the purpose of organizing praxes.

experiences, if utterances serve the interpreter as an instruction for simulating a visual experience in the absence of the respective stimuli. This means that figure and ground are also present in and relevant for conceptualization, and that they are coded in actual syntactic structures.

Imagine my colleague Alex really fell off his bike in front of our research institute, that I have witnessed this event, and that later I were – by some reason or other – to report this to you who most probably does not know Alex, his bike, the way he rides it, and the institute. However, I have perceived this event, so all the processes characterized in the former sections take place, including figure/ground segregations. Hence, I have sensed, recognized, and integrated into wholes the objects involved in this event. I also have identified/categorized them. That means from the constant flux of impressions around me I have singled out – among other things – Alex from the background, his bike from the background, Alex from his bike, the institute from the background, Alex and his bike from the institute, all this through time. I have identified the objects involved as being members of categories of differing generality. ALEX is a very specific concept, as well as ALEX' BIKE and the INSTITUTE. According to the gestalt laws and to the purpose-dependency of identification/categorization, I could have identified them as members of other, more general categories, as well. For instance, I could have treated Alex as some UNSPECIFIED PERSON, possibly resulting in a verbalization like *Someone fell off his bike* or I could have treated Alex and his bike as one (*Alex fell over in front of the institute*). I even could have identified the whole event in a very general way (*An accident happened in front of the institute*). I could even say *Something happened in Marburg* and "mean" that Alex fell from his bike in front of the institute.

This is an important point which demonstrates how figure/ground segregation in sensation may differ from figure/ground segregation in identification (and conceptualization): The components of the sensed event remain the same (Alex, the bike, the institute). The figure/ground segregation of my sensing the event is rather fixed. But in the moment top-down identification (and conceptualization) comes into play, this fixation is lapsed. Let us for now presuppose verbal utterances refer to conceptualizations. Conceptual flexibility in figure/ground segregation would be demonstrated in utterances like *Alex fell in front of the institute*, although Alex and his bike fell. What I have done in uttering this is conceptualizing [Alex and his bike] which from the perspective of sensation are two objects as a single object referred to by *Alex*, more precisely as an integrated figure relative to the institute which functions as ground here. To be sure, the figure/ground configuration of the sensation of this event remains the same. But I am able to flexibly "operate" on this figure/ground structure conceptually and to apply figure/ground segregations on different levels of specificity and generality in identification/conceptualization, in dependence of the purposes I pursue.

From now on I will terminologically accommodate this difference between sensation and identification/conceptualization with respect to figure and ground, such that the conceptual analogues of them will be termed "trajector" and "landmark", respectively (cf. Langacker 1987 et sqq.).[118] Then, one can state that trajector-landmark configurations can be recursively organized, while this is less clear for figure/ground configurations. By recursion I mean

[118] Notice, however, that my usage of the terms differs from that of Langacker who does not draw the analogy from sensation in the same manner as I do.

embeddedness in the sense that one trajector-landmark configuration can function as trajector of a higher-order trajector-landmark configuration.

To be more precise, actors/cognizers can apply trajector-landmark segregation, depending on their (maybe communicative) purposes (pertinence), at different levels of specificity/generality of conceptual contents, whether retrieved from memory or with respect to novel conceptualizations.

If figure/ground segregation in sensation is all about integrating visual features from the visual field into whole objects, and if trajector-landmark segregation is conceptually more flexible in the way outlined, and if finally conceptualization is simulated perception, then we have to ask what an object in identification/conceptualization (cf. Humphreys & Riddoch 2007) is. The negative answer must be that it cannot be fixed in the way objects in sensation are.[119] To have this demonstrated, consider Figure 3.22 a) below which is adapted from Jackendoff (2007: 18): What we see in Figure 3.22 a) is *x*'s. However, the arrangement of *x*'s in (a) can be treated to exhibit different figure/trajector-ground/landmark configurations. I will treat (b) to (g) as different possibilities of carrying out figure/trajector-ground/landmark segregations on the basis of (a).[120] In (b) we can "see" two *x*'s arranged in $pair_1$ blocks (i.e., one pair block as figure/trajector). That means we can single out from the Figure (a) any pair block and segregate it as figure/trajector from the rest which functions as ground/landmark then. In (c) *x*'s are arranged in a column (i.e., a column can be picked out from (a) as figure/trajector), in d) *x*'s are arranged in a $higher\text{-}order_2$ block that can be singled out from (a) as figure/trajector), in (e) *x*'s are arranged in a $higher\text{-}order_3$ line, picked out from (a) and functioning as a possible figure/trajector. Due to a violation of gestalt laws (proximity; indicated by "#") it is more difficult to treat a $higher\text{-}order_2$ column, as in (f), or a $higher\text{-}order_2$ line, as in (g), as a possible figure/trajector, if both shall be singled out from (a). Finally, (a) itself as a whole can also possibly function as a $higher\text{-}order_3$ block, such that the whole block can be treated as figure/trajector relative to a (back)ground.

a) xx xx xx xx xx xx xx xx
xx xx xx xx xx xx xx xx
xx xx xx xx xx xx xx xx
xx xx xx xx xx xx xx xx

xx xx xx xx xx xx xx xx
xx xx xx xx xx xx xx xx
xx xx xx xx xx xx xx xx
xx xx xx xx xx xx xx xx

[119] In fact, they are not. But objects in conceptualization are even less fixed.
[120] In what follows, subscripts symbolize the level at which segregations are executed, since figure/trajector-ground/landmark segregations may be embedded in "higher-order" segregations. The latter have number subscripts, higher numbers indicating more embeddings.

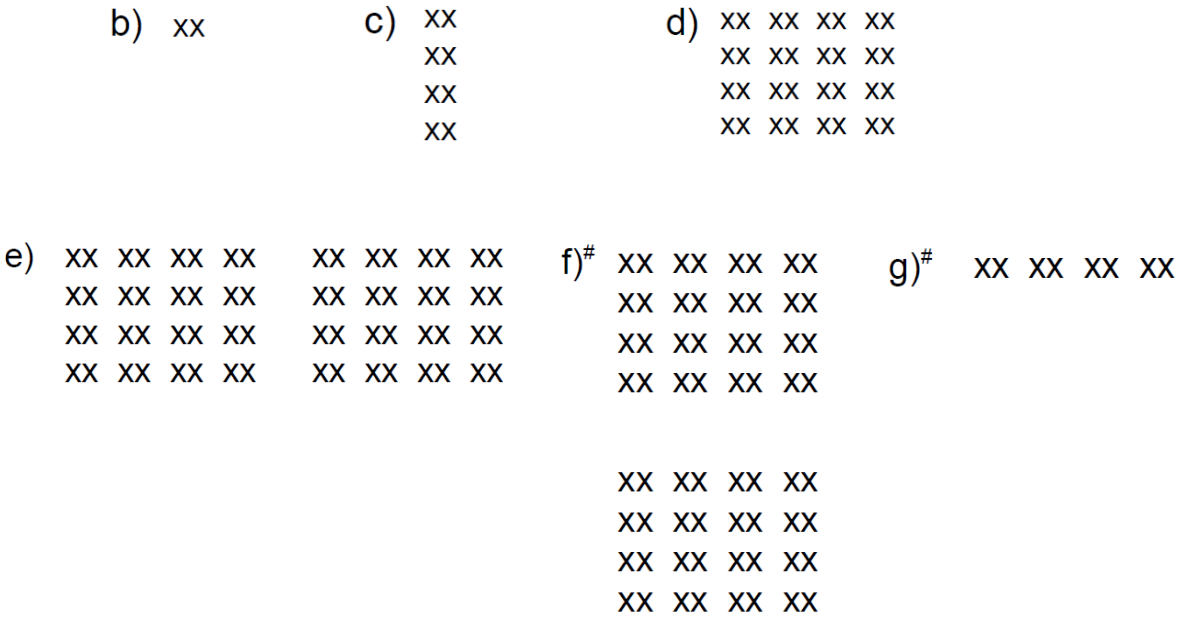


Figure 3.22: Recursion in vision

It seems that the more embedding there is the more difficult it is to conceive of the unit in question as figure/trajector, such that it is easiest to treat a block pair (b) as figure/trajector and most difficult to treat a higher-order$_3$ block (a) as figure/trajector (except for the Figures involving gestalt violations). It is difficult to decide whether these visual effects that arise when looking at Figure 3.22 a) belong to sensation or identification. However, the latter should allow for the greater recursive flexibility. One could speculate, however, that figure-aptness and trajector-aptness split up the more complex a unit becomes, from least complex (b) to most complex (a) (ignoring (f) and (g) again).

One indicator that this could indeed be the case is the above example of Alex falling off his bike in front of the institute. Conceiving of this whole configuration as functioning as an integrated figure (in sensation) seems impossible. Humphreys and Riddoch (2007: 537f.) discuss what the largest unit of sensation might be, and they conclude that the crucial factor is co-occurrence of objects in states, processes, or activities. Statistically, the more frequently objects co-occur in them (e.g., they obey the gestalt law of common fate in that they move together relative to a stationary ground) the more easily they can be integrated into a whole. How often do we observe persons, their bikes, and buildings moving together relative to a stationary ground? Hardly ever, I would think. However, imagine you "zoom out" of the scene of Alex falling off his bike in front of the institute such that you see the institute with the street in front of it and Alex with his bike from 30 meters above, including neighboring buildings, bushes, streets etc. Now imagine an earthquake happens that affects only the institute, Alex and his bike in front of it, leaving neighboring buildings, bushes, streets etc. out. Only the former are shaken by it. What you have accomplished conceptually then is making the whole configuration of Alex, the bike, the institute, and the relations between them a conceptual trajector relative to a stationary ground, on a very high level of generality.

Another indicator could be the previously discussed high correlation between foveal seeing and attending, i.e., the identity of what we visually focus on and of what we attend to (see section 3.1.4.1). Embedding figure/ground configurations into ever greater figure/ground configurations deprives the perceiver (in dependence of his distance to the stimuli) of being

able to focus the figure. This might be what makes it impossible to treat Alex, his bike, and the institute as a figure in sensation relative to Marburg as a whole – there is usually no viewing arrangement achievable in which this could be focussed.
The main reason why conceptualization seems to be more flexible than sensation with respect to figure/ground segregation is the character of conceptualization as simulation. This absolves the conceptualizer from actualities like his/her vantage point – if he/she wanted he/she could "view" everything from the bird's eye view, thereby applying a very general trajector-landmark segregation to the objects and locations in his/her (simulated) visual field.
To sum up, we have seen that conceptualization as simulated perception even extends to the mechanisms of object integration. The mechanism of figure/ground segregation in sensation parallels the mechanism of trajector-landmark segregation in identification/conceptualization. The difference lies in the flexibility with which the latter makes use of the mode of operation of the former. While it is easy to say what the shape and outer boundaries of [Alex on his bike] is on the basis of the features of this unit in sensation, it is much harder to say what the features of the trajector [Alex on his bike in front of the institute] are. In conceptualization the definition of "object" is somewhat blurred.
I would like to take syntactic structures reflecting trajector-landmark configurations in fairly regular ways as evidence for the viability of the claim that syntactic structures indeed code conceptual structures.

If linguistic^{o} structures are conceived of as instructions for conceptualizing states, processes, and activities, and if conceptualization mechanisms parallel mechanisms of sensation, then it is highly plausible that languages have developed means to externalize these organizing mechanisms of sensation and conceptualization for the sake of communicative needs which, in turn, are practical needs.

In the next section I will illustrate the systematic character of trajector-landmark segregations in conceptualization and their linguistic^{o} realization.

3.3.2 Motivation and exploitation in trajector/landmark-syntactic structure mappings
By means of the following examples I will try to demonstrate the component parts of trajector-landmark configurations, and the regularities in how they are syntactically expressed.

(3.1) *The ball rolls into the room.*

(3.2) *John dances.*

(3.3) *The sun is going down.*

(3.4) *I hate you.*

(3.5) *I have a headache.*

(3.6) *I give you flowers.*

(3.7) *Tom pours water into the glass.*

(3.8) *Alex* *ähnelt* *Mario.*
Alex.3.NOM resemble.3 Mario.DAT
'Alex resembles Mario.'

(3.9) *Mario* *ähnelt* *Alex.*
Mario.3.NOM resemble.3 Alex.DAT
'Marion resembles Alex.'

(3.10) *Mario* *und Alex* *ähneln* *sich.*
Mario.3SG.NOM and Alex.3SG.NOM resemble.3PL each other/themselves
'Mario and Alex resemble each other.'

(3.11) *Vor* *der Kirche* *steht* *Alex* *rechts von Matthias.*
In front of the.DAT church stand.3 Alex.3 right of Matthias
'Alex is standing to the right of Matthias in front of the church.'

(3.12) *Sie* *stehen* *vor* *der Kirche.*
They.3 stand.3 in front of the church
'They are standing in front of the church.'

(3.13) *Something happened in Marburg.*

Up to this point, figures/trajectors have been symbolized by circles and grounds/landmarks by rectangles. This must now be refined. It has been mentioned in section 3.1.3.3 that grounds (and therefore landmarks) come along as either locations or as exhibiting object features, just like figures. These types of landmarks will now be distinguished symbolically, as given in Figure 3.23 below.

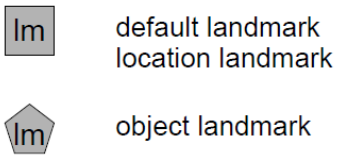


Figure 3.23: Location and object landmark (to be refined once more in section 3.4.8)

For the sake of "iconicity" location landmarks will eventually be depicted as large rectangles, emphasizing the size of the locations they symbolize.

Now consider the approximate corresponding representations of sentences (3.1) to (3.13) in terms of trajector-landmark configurations.[121] These configurations are schematizations. Such spatial schemas are further discussed in section 3.3.4.

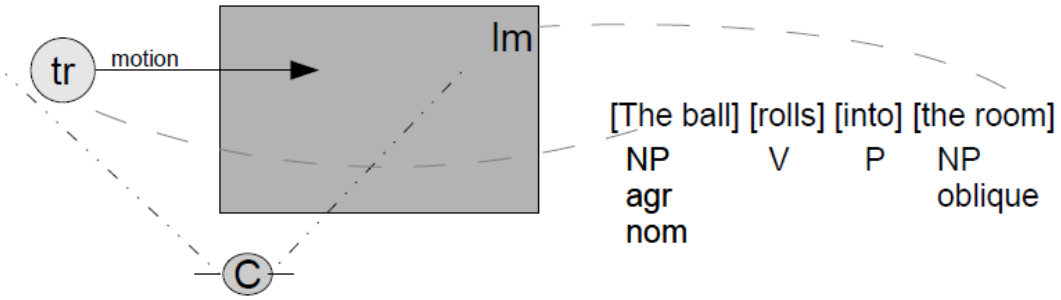


Figure 3.24: Correspondences between spatial conceptual structure and linguistic^{o} structure for (3.1) The ball rolls into the room

In Figure 3.24 some object is conceptualized as moving relative to some location, whereby the first object is a ball and the location is a room (as a three-dimensional container, presumably). This takes place within the simulated visual field (dotted lines leaving "C") of the conceptualizer ("C"; lines leaving C indicate his/her shoulders and thus our view on the scene from above). The ball functions as trajector and the room as landmark here. This is because the ball is smaller and more mobile, hence the "better" trajector. The trajector moves along the path indicated by the arrow and ends inside the room. The landmark extending beyond the conceptual field of the conceptualizer shall capture the fact that he/she presumably cannot conceptualize the entire three-dimensional container but only part of it (due to the fact that his/her perspective is limited). Note that temporal relations are not depicted here and that the end of the arrow is the only indicator of the resultant situation. One should also keep in mind that the trajector is never conceptualizable without a landmark, and that the whole event must be thought of as taking place relative to an implicit, higher-order ground "behind" the depicted schematic, in relation to which the event of the ball rolling into the room functions as trajector. In the case of such a motion event the trajector is realized as an NP with nominative case which agrees with the verb. The landmark is coded by another NP with oblique case[122]. The verb encodes some motion and manner of motion. The preposition contributes the path to the motion. Together, verb and preposition encode the relation in which trajector and landmark stand.

[121] For symbolology see the list of symbols at the beginning of this book.
[122] For now only the presence of nominative cases is of some importance. All other cases will be treated as oblique for now (cf. Blake ^{2}2001: 30f.). But see chapter 4.

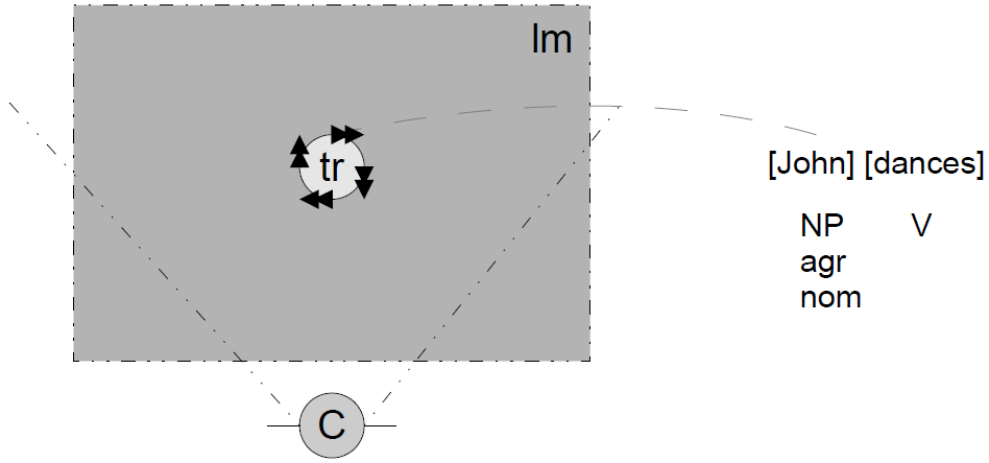


Figure 3.25: Correspondences between spatial conceptual structure and linguistic^{o} structure for (3.2) John dances

Figure 3.25 depicts an event in which some relatively small, mobile object moves in relation to an unspecified, relatively large, immobile background. The object, a person moving either around its own axis or along a trajectory or both, is therefore again conceptualized as trajector relative to an unspecified ground. The background might, but need not be, entirely in the conceptual field. It is, however, not linguistically^{o} realized but left implicit, as is the concrete manner of movement. The trajector functions again as nominative NP, agreeing with the verb. Note how much conceptual freedom a hypothetical speaker leaves for a hearer in making this utterance (given the hearer has no percept of this event at his/her disposal). If *John dances* really encodes the speaker's conceptualization and must be decoded to enable the hearer's conceptualization, and if conceptualization is simulated perception, then there need not be much overlap in both conceptualizations to make successful communication possible in this case (depending on the communicative goals of the interactants).

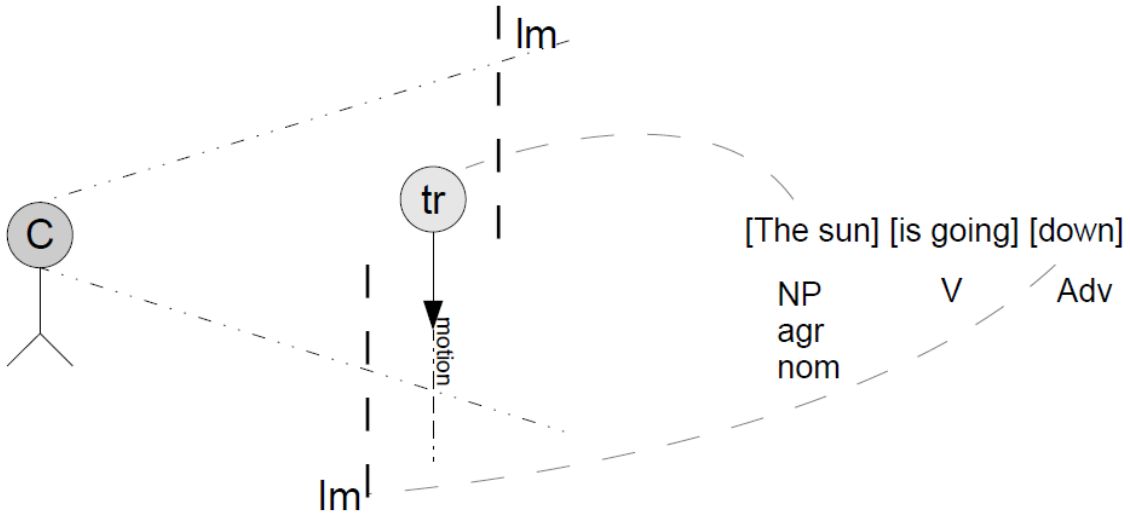


Figure 3.26: Correspondences between spatial conceptual structure and linguistic^{o} structure for (3.3) The sun is going down

Figure 3.26 shows the spatial conceptual layout of the sun going down.[123] The sun is – apparently – the moving object here. It is also small relative to the landmark against which it moves. The trajector leaves the conceptual field here and has no specified point of destination. That the sun moves further downwards after it left the conceptual field is an inference but not an experience. It is possible that the sun disappears while it remains in the scope of the conceptual field. This might sound contradictorily but imagine that the ground against which the sun moves consists of the sky and the ocean. Then the sun will gradually disappear in front of the sky but behind the ocean. That means the landmark turns out to be bipartite as the trajector is moving. In other words, the sun as trajector occludes part of the upper landmark but the lower landmark gradually occludes the entire trajector. Again it is the trajector which is linguistically^{o} realized as nominative NP and which agrees with the verb. Neither of the landmarks is realized but clearly implicit in the directed motion of the trajector. Only the path of the trajector is realized by means of the particle *down*.

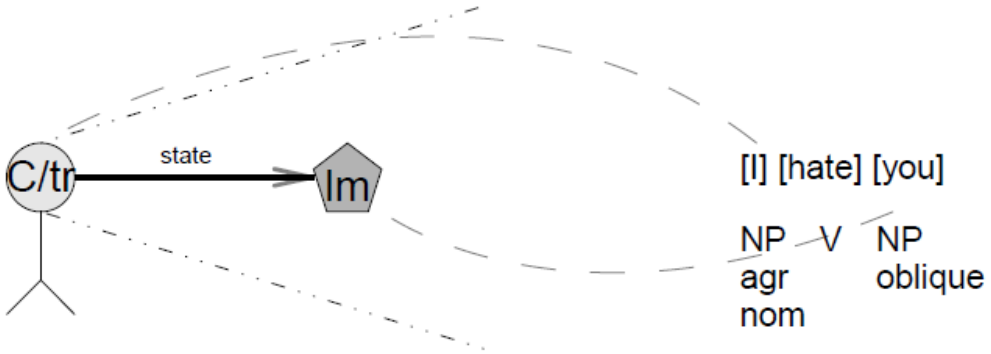


Figure 3.27: Correspondences between spatial conceptual structure and linguistic^{o} structure for (3.4) I hate you

There are two aspects in which the constellation in Figure 3.27 differs from the previous ones. First, the conceptualizer is identical with the trajector. Second, featurally the landmark hardly differs from the trajector, i.e., both objects seem to be similarly trajector-apt. The reason why conceptually "I" is the trajector is that it is "I" whose state is specified relative to "you" and not the other way around. That means "you" is the entity against which the status of "I" is characterized, just like the room is the entity against which the status of the ball is characterized in (3.1) above, and like the implicit background of the sun is the entity against which the downward motion of the sun is settled in (3.3) above (cf. Talmy 2000, I, 315f.). What we see here is that some non-spatial relation – hate of one person toward another – exploits the conceptual mechanisms originating in the spatial domain and with this in (visual) perception (cf. Lakoff & Johnson 1980, 1999; see sections 3.3.2/3.3.3 on a discussion of "exploitation"). Although there is no movement involved in the circumstance of a person hating another person there is a grey arrow depicted in Figure 3.27, complementing the black line indicating a stative relation. This arrow symbolizes fictive motion/movement. That means building a concept from the utterance *I hate you* involves the fictive movement of the eye gaze of the conceptualizer/trajector to the referent of *you*, or, in other words, the directedness of the circumstance of hating. The linking mechanism is the one familiar from the previous

[123] Icon: the body of C indicates our looking at the scene from the side.

examples: The trajector is linked to the nominative NP, the landmark is linked to an oblique NP, the circumstance is expressed by the verb.

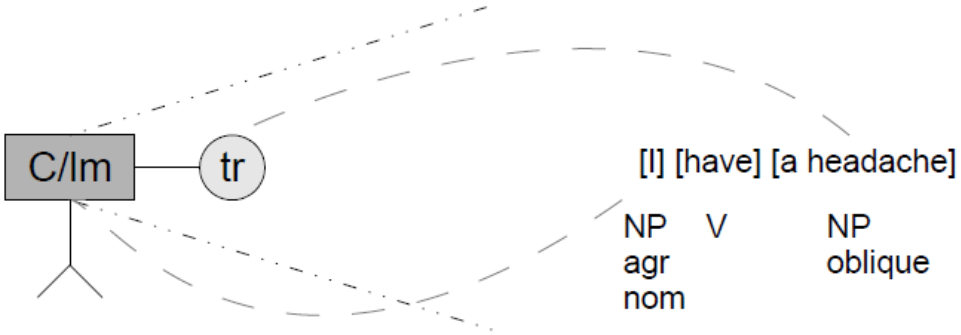


Figure 3.28: Correspondences between spatial conceptual structure and linguistic° structure for (3.5) I have a headache

Possession, which we are talking about when dealing with (3.5), is a quite intricate matter. Even apart from its formal expression in language linguists have no unanimous concept of possession (e.g., Seiler 1983; Chappell & McGregor 1996; Heine 1997; Lehmann 1998; Langacker 2000, ch. 6; Stolz et al. 2008). However, something like a minimal consensus seems to be that possession exhibits at least some specific components: a possessor (PR), a possessee (PM), and the possessive relation itself which is often characterized as PM's location at PR and/or PR's control of PM (cf. Stolz et al. 2008: 17ff.). Moreover, the relation between PR and PM may vary along a scale of separability, usually termed (in)alienability. I would like to put the control aspect aside for now (this is rather an actional matter; see section 3.2.2) and capture the intuitions on possession by means of location and separability alone. PMs that have a constant, fixed location at PR and/or are hardly separable from them are inalienable from PR to a high degree. An example would be the body parts of an animate possessor. Things whose position may be at PR but where their being located at PR is a contingent and temporal matter are more alienable. An example would be the knife, fork, and spoon someone "has" during dinner. Looking at the spatial conceptual structure underlying (3.5), it is only a stative relation of a trajector relative to a landmark such that the former "is located at" the latter. But possession is not location but supposedly location plus something else to which separability belongs. I would like to characterize this second component of possession by means of looking at the verb *have* in English (and *haben* in German) which is the most conventional means of expressing (clause-level) possessive relations. When we look into the semantics of *have* we actually find a spatial conceptual correlate of control: English *have* and German *haben* derive from Germanic **habǣ-* which is the durative form of Germanic **hafja-* 'lift' ('heben') (cf. Kluge [24]2002). Thus, *have* has gone through a process of meaning extension at the beginning of which it meant something like 'hold' (German *halten*) which can very well be treated as the durative of 'lift'. Applying these insights to the spatial conceptual structures underlying possession, one can identify it as the combination of PM's being located at PR and at the same time making contact (in terms of "holding") with it. When we relate this to the perceptual mechanisms outlined in previous sections, we see that a possessor and its possesse – apart from standing in a possessive relationship – also make a good figure if integrated into one. When a human possessor "has" some possessee and

engages in some movement, then he/she is, as a whole, the figure of movement such that the PM moves with him/her. If he/she does not have it, it does not move with him/her. It is then alienable. On the other hand, body parts always (or nearly always) move with their PR. Together, PM and PR make a good integrated figure, even more so when one considers their frequency of joint occurrence, i.e., they never (or hardly ever) occur in isolation. This special form of contact is simply the part/whole relation of body and parts and consequently the inalienable possessive relation *par exellence*. Holding cutlery in one's hands while moving, in contrast, makes the mover with the cutlery also a good figure, but they often occur independently of each other, and so this is an alienable instance of possession.

Keeping the making-contact core of possession in mind, we see that the PM must be the trajector relative to the PR. The PM is more mobile and changes location more often relative to the PR. At the same time, the PR has the PM at his/her "disposal" (cf. Langacker 2000: 177), i.e., he/she can (in the case of dishes) or must (in the case of an ache) act with it. Something like this must be the core of the concept of possession, i.e., its conceptual structure without any metaphorical extensions and sociocultural impositions the additions of which yield the concepts underlying *gehören zu* 'belong to' or *besitzen* and *gehören* 'own'.

The emergent pattern from the cases further above is that trajectors are syntactically realized as nominative NPs which agree with the verb. But in the present example it is obviously the PR, functioning as a landmark of the PM, which occurs in this form. It is characteristic of the possessive relation with *have* that the trajector/landmark-syntactic complement mapping is reversed in its syntactic realization.[124]

[124] This analysis disagrees with that of Langacker (2008a: 507) who identifies PM as landmark and PR as trajector. Given the definitions of trajector and landmark developed here, there this analysis is not available here. However, Langacker characterizes his trajector differently, namely as "the entity being located, evaluated, or described." (cf. Langacker 2008a: 70). However, I think that in a sentence like *Alex has the earrings* Alex is the entity being evaluated, but that the earrings are those being located. Consequently, both entities must be analyzed as trajectors, while there are apparently no landmarks, which I deem an impossible and undesirable configuration. In contrast to Langacker, Lakoff & Johnson (1999) note the shift in trajector-landmark configuration in going from a locational to a possessive relation.

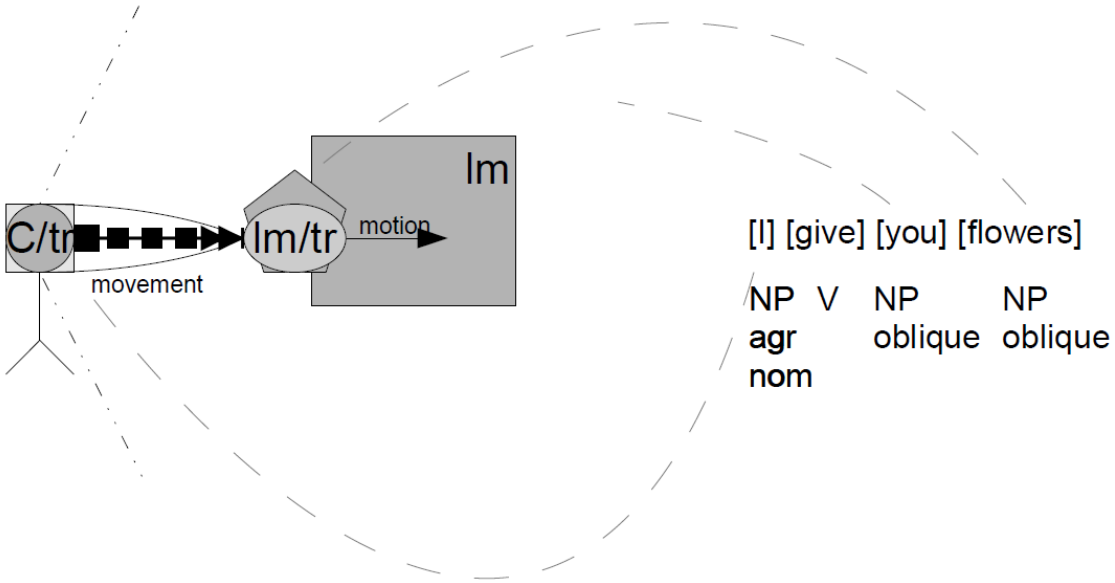


Figure 3.29: Correspondences between spatial conceptual structure and linguistic^{o} structure for (3.6) I give you flowers

In (3.6) and the corresponding Figure 3.29 another factor comes into play, complicating matters considerably: time. While in the foregoing examples the trajector was mostly situated relative to a landmark and changed its position relative to that same landmark, we have here multiple trajectors and landmarks at different levels of generality, due to the fact that the objects involved in the event play different roles at different points in time of the event. Although the temporal factor will be topic of section 3.4, consider the following: In the event of me giving you flowers it is the conceptualizer (me) functioning as landmark in the first instance. For the first conceptualized part of the event the flowers are located at and in control of me (i.e., a possessive relation). "I" am a larger object than the flowers and the flowers are, given their affordances on the basis of what a human individual can potentially do with them, more mobile. In transferring the flowers to you, I must engage in movement, i.e., I must somehow act such that the flowers move towards you. In doing so only part of the giving person moves, namely the arm (indicated by the thin lines leaving C/tr towards tr/lm). Even if I hand over the flowers while walking it is the arm which moves additionally to the rest of my body, which makes the faster movement, and which is smaller relative to the rest of the moving body; the movement of the arm is embedded in the movement of the body. On this level of generality/specificity the flowers in the hand of the moving arm function together as the trajector relative to the rest of the body. On a more general level "me", as a whole, including my state or movement plus my moving arm and the flowers, functions as a trajector relative to you. In that way I, whether moving my whole body or not, but with the moving arm, with the flowers in hand, am – as a trajector – situated or characterized as a whole relative to you, namely in that Í am the giver of flowers with respect to the landmark which is you. Note that there are switches in focus of attention involved here, or, as one could say, switches in the mode of seeing, like with the Rubin face or the Necker cube (see Figures 3.2 and 3.3 above). It is therefore not possible to simultaneously conceptualize the arm of "I" as trajector and the whole "I" including the arm, also as trajector. Thus, conceptualizing a giving

event may involve several such switches which constitute changes in trajector-landmark configurations, while it remains an integrated event. Figure 3.29 above can therefore only approximately capture the actual circumstances in a giving event (but see section 3.4 and chapter 4.4.4). One should note, however, one additional aspect, namely the flowers' (depicted as lm/tr) functioning as landmark of the giver's movement towards it, and as trajector of its own motion relative to the addressee of giving. The linguistic^{o} realization of this event will be discussed later. It is worth mentioning that the utterance *I give you flowers* seems to emphasize not the "I"'s possession of flowers, but the transfer of the latter. Thus, the trajector of the first movement/motion sub-part of the entire event of giving is realized as an NP in the nominative, agreeing with the verb – in the now familiar and straightforward way. Both other objects are realized as oblique NPs (for the how and why, again see sections 3.4 and 4).

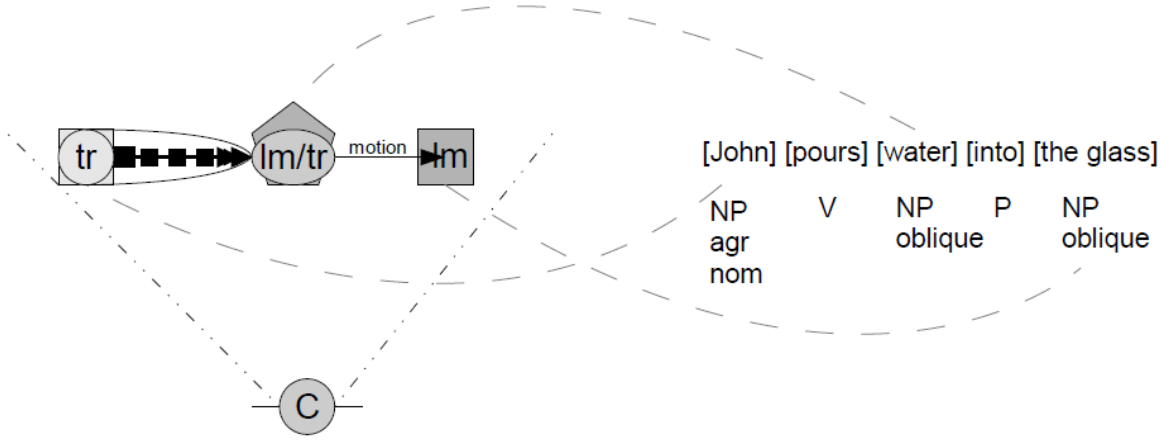


Figure 3.30: Correspondences between spatial conceptual structure and linguistic^{o} structure for (3.7) John pours water into the glass

In Figure 3.30 the movement of John (tr) towards the water (lm) is depicted. In a further sub-part of the circumstance the water becomes a trajector when it moves towards, i.e., in reference to, the glass. The first mover in this event (John), which is also the first trajector, is again realized in the familiar way. The object functioning as landmark of John's movement and as trajector of the motion towards the glass (namely, the water) is realized as an oblique NP. The concept of GLASS as a landmark is realized as an NP following a preposition. We see here again that not only the applied level of specificity/generality in conceptualization (as in the case of the body, arm and flowers in 3.6) but also the temporal organization of circumstance concepts is associated with changes in trajector-landmark configurations.

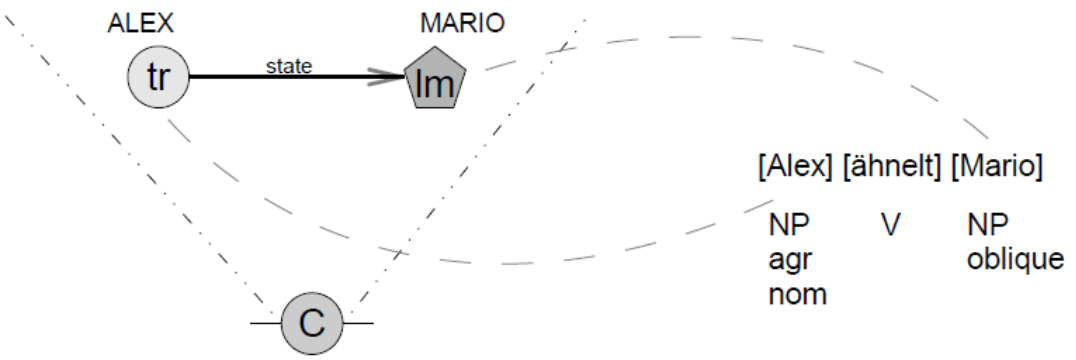


Figure 3.31: Correspondences between spatial conceptual structure and linguistic° structure for (3.8) Alex ähnelt Mario 'Alex resembles Mario'

In Figure 3.31 we have the famous case of a seemingly symmetric relation. Symmetry in this context means that one would think that the relation of Mario to Alex is identical to that of Alex to Mario. This is not valid for *I hate you*, for instance, because while the relation of "I" to "you" is one of hating, the reverse need not be the case. But while it might be true that if Mario resembles Alex, Alex also resembles Mario, this ignores the role of the distribution of attention (and simulated foveal seeing in terms of fictive motion/movement) in such relations. Obviously, we have two similar candidates for being the trajector here. The reason Alex functions as trajector here is that it is Alex whose state, i.e., some feature of him and not of Mario, is specified relative to Mario and not the other way around. That means Mario is the entity against which some feature of Alex is characterized. As it were, the simulated eye gaze of the conceptualizer starts at Alex, picks out some feature (which is only possible by means of (simulated) foveal seeing, i.e., a simulated visual focus on it) and checks it against the landmark constituted by Mario. This course of events clearly differs from that in which the roles are reversed, as given in Figure 3.32 below, even if the results of both conceptualizations may be identical. It is in both cases the trajector which is realized as the nominative NP that agrees with the verb.

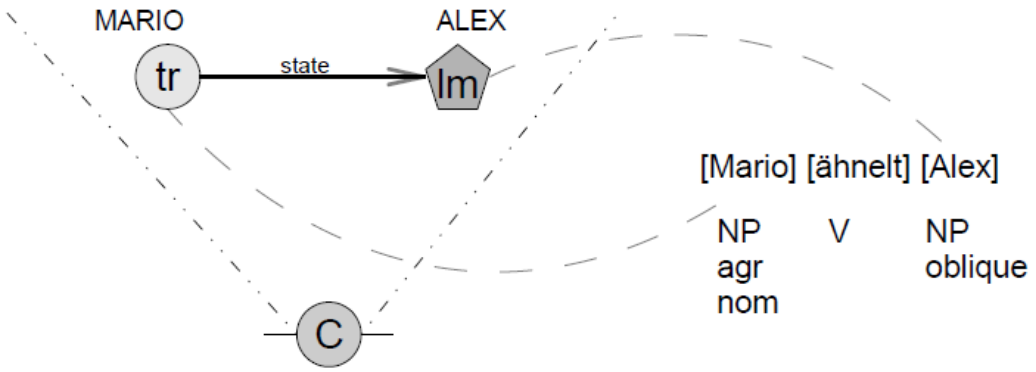


Figure 3.32: Correspondences between spatial conceptual structure and linguistic° structure for (3.9) Mario ähnelt Alex 'Mario resembles Alex'

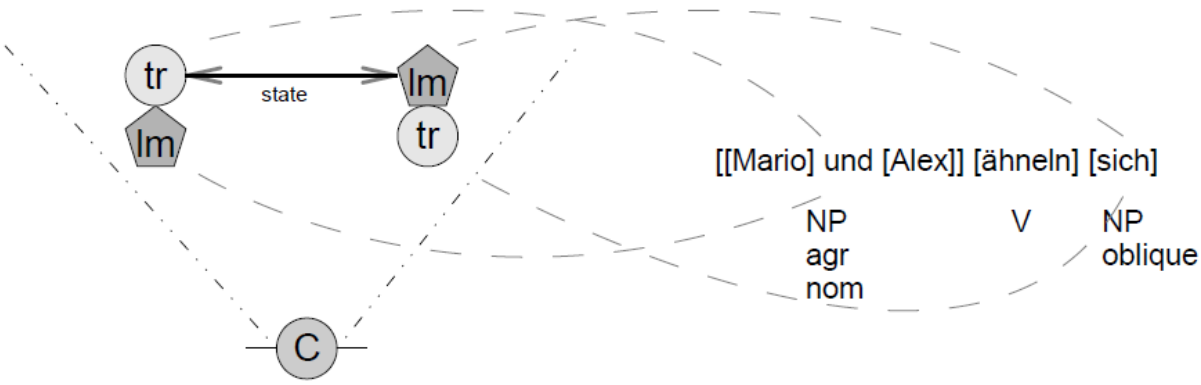


Figure 3.33: Correspondences between spatial conceptual structure and linguistic^{o} structure for (3.10) Mario und Alex ähneln sich 'Mario and Alex resemble each other'

In discussing Figure 3.33 we will start by looking at the linguistic^{o} structure first and ask then what conceptual implications it bears. In this Figure I have proposed a static spatial conceptual structure supposedly underlying *Mario und Alex ähneln sich* 'Mario and Alex resemble each other' but involving fictive motion again. Generalizing on the mechanisms of the previous cases where the trajector was linked to the nominative NP agreeing with the verb one would treat *Mario und Alex* as a unit here, functioning as trajector conceptually, since they stand in nominative case and, constituting a plurality of individuals, agree with the verb. Figure 3.33 shows something different, however. The reason is that I consider the implications of the solution just mentioned as mistaken. It is actually not the case that the sentence means that [Mario and Alex] resembles [Mario and Alex] but that Mario resembles Alex and that Alex resembles Mario, which are not identical with respect to the course of conceptualization, as we have seen. There is thus not a unique trajector [Mario and Alex] but the spatial conceptual structures underlying *Alex ähnelt Mario* and *Mario ähnelt Alex* added together. Conceptually this would mean that we have the spatial conceptual structures shown in Figures 3.31 and 3.32 together, conceptualized one at a time, as underlying (3.10). It is conceivable that first the conceptualization underlying *Mario ähnelt Alex* takes place and then, by a shift of focus, that underlying *Alex ähnelt Mario*. In other words, the spatial conceptualization of *Mario and Alex ähneln sich* would be constituted by the simulated (and maybe repeated) gaze of the conceptualizer from Mario (trajector) to Alex (landmark) and from Alex (trajector) back to Mario (landmark). From this perspective, the relation between the linguistic^{o} structure of (3.10) and the spatial conceptual structure in Figure 3.33 is all but straightforward, in that the nominative NP does not code a single trajector or landmark but two trajectors from two different conceptualizations at two different points in time at once.[125] But for reasons of learnability and cognitive economy it would be desirable to be able to relate trajector-landmark structures straightforwardly to syntactic structures. But what [NP *and* NP *ähneln sich*] codes lies simply outside what is conceptually possible, since it is an instruction to simulate a perception that cannot be obeyed as easily as (3.1) or (3.2). Why should such structures exist, then? For a symbol system it is no problem to develop a unique symbolic assembly (*Mario und Alex ähneln sich*) coding two relations at a time that must be

[125] That this problem is not due to the coordination in the nominative and agreeing NP can simply be demonstrated by examples like *Mario and Alex enter the book store* where Mario and Alex together constitute a unique though complex (i.e., non-atomic) trajector relative to the landmark of the book store.

conceptualized one after another; see especially section 3.3.8 on this feature of the linguistic^{o} symbol system). From the perspective of conceptualization and because conceptualization is simulated perception it is impossible for us to preserve this simultaneity the syntactic structure pretends. We cannot distribute our attentive foveal seeing and track what is going on in our environments in the way it would be required by this sentence, if understood as an instruction for conceptualization, due to the limitations of our biotic makeup. In syntax it is possible to fuse two conceptualizations that are similar but not aligned with respect to their trajector-landmark configurations into one structure, i.e., to synchronize, or compress, what is conceptually asynchronous, or uncompressed.

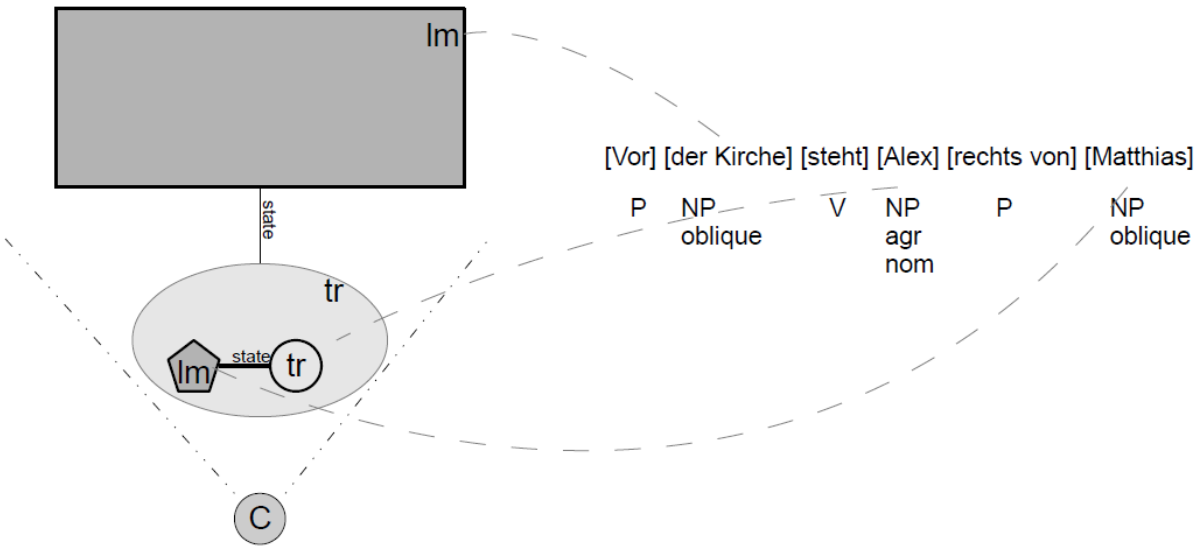


Figure 3.34: Correspondences between spatial conceptual structure and linguistic^{o} structure for (3.11) Vor der Kirche steht Alex rechts von Matthias *'Alex is standing to the right of Matthiasin front of the church.'*

What is new in Figure 3.34 above is two things. This is first the implementation two trajector-landmark configurations from two levels of specificity into one clause. In (3.11) the position of Alex in space is determined relative to the position of Matthias in space. That is, Alex functions as trajector relative to the landmark Matthias. The conceptualizer singles out Alex and specifies his position in reference to Matthias. Now both Alex' and Matthias' joint position is again specified relative to a higher-order landmark against which Alex and Matthias function as an integrated trajector. This higher-order landmark is *Vor der Kirche* 'In front of the church'. Hence, in the sentence (3.11) a higher-order landmark is made explicit, while it is left implicit in, for instance, (3.2) above (*John dances*). In this way the higher-order landmark situates the relation in which Alex and Matthias stand in the conceptual field, while it leaves the inherent nature of the relation untouched.

The second new aspect in (3.11) and the correspondent Figure 3.34 is that the position of the trajector Alex relative to Matthias can be specified only by resorting to a reference frame that is applied to the relation between Alex and Matthias. Forget Figure 3.34 for a moment and treat (3.11) as an utterance detached from the spatial relations depicted in that Figure. Then you might find the utterance ambiguous with respect to the exact relation of Alex and Matthias. What does *rechts von* 'to the right of' mean here? Is Alex to the right of Matthias

relative to (a) their position in the conceptualizer's conceptual field? Or is Alex to the right of Matthias relative to (b) Matthias' viewing direction? The answer depends on the reference frame one applies (cf. Evans & Green 2006: 71ff., Levinson 1996). If the speaker leaves unspecified the reference frame he/she has applied (let's say (a) the conceptualizer-based frame) and if the hearer takes the utterance as an instruction to conceptualize a situation, he/she might conceptualize it differently from the speaker (let's say by using (b) the landmark-based frame) which might lead to a misunderstanding.
With respect to the linguistic^{o} realization, Alex is an NP in nominative case that agrees with the verb. Matthias is realized as NP in an oblique case, governed by a preposition which together with *rechts* specifies the relation between the two NPs. The higher-order landmark *Vor der Kirche* is realized as a distinct and optional syntactic unit, namely a prepositional phrase. Alex' and Matthias' role as a higher-order trajector is only implicit in (3.12).

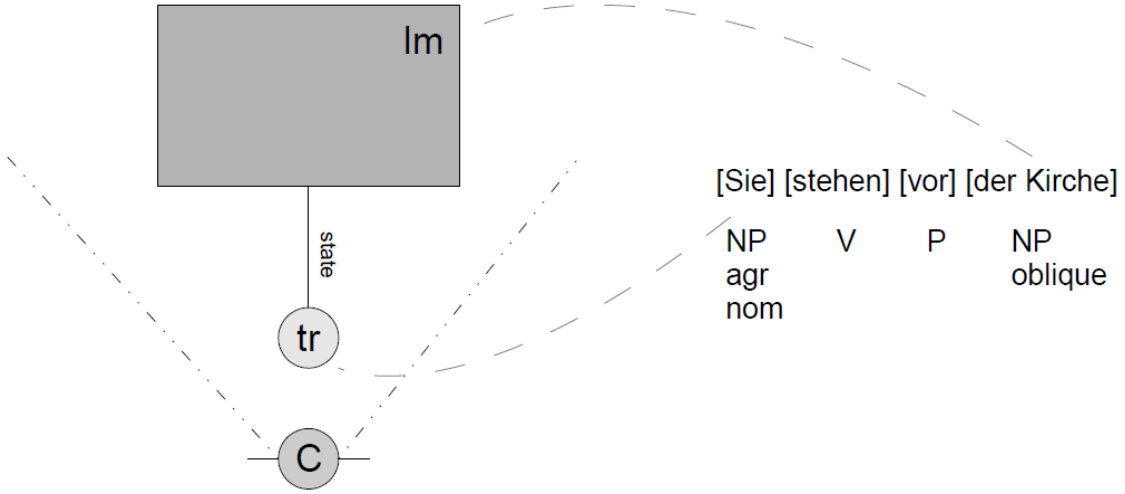


Figure 3.35: Correspondences between spatial conceptual structure and linguistic^{o} structure for (3.12) Sie stehen vor der Kirche 'They are standing in front of the church'

Sentence (3.12) and Figure 3.35 leave unspecified the spatial relation between the objects referred to by *sie* 'they'. It is also unspecified whether it is persons, cars, Alex and Matthias, or the Ten Commandments carved in stone that stand in front of the church in the circumstance coded by (3.12). In any case the referents of *sie* are treated as an integrated trajector here and are located in reference to the church as landmark. If it is Alex and Matthias from Figure 3.34 which constitute this trajector here, it is the higher-order trajector-landmark configuration left implicit in Figure 3.34 (i.e., that between [Alex and Matthias] and the church) which is verbalized in (3.12). Syntactically, the higher-order landmark in Figure 3.34 (the church) becomes an obligatory NP in Figure 3.35, and the implicit higher-order trajector in Figure 3.34 ([Alex and Matthias]) functions as nominative NP and agrees with the verb in Figure 3.35. Note that the obligatoriness of the oblique NP in (3.12)[126] is the result of the fact that this sentence codes a trajector-landmark configuration on a single level of specificity, while in (3.11) the PP *Vor der Kirche* is optional because it constitutes a higher-order landmark relative to the trajector-landmark configuration of Alex standing besides Matthias.

[126] *Sie stehen* 'They are standing.' may be a grammatical sentence in German when the question of how 'they' are located in space is focused. A focus on where they are located makes a PP obligatory.

As a result, what we see when considering (3.11) and (3.12) as well as their corresponding conceptual structures is that when applying different trajector-landmark configurations to a single real-world circumstance conceptually, this results in very different syntactic structures when verbalizing these concepts, demonstrating a quite regular conceptualization-syntactic structure correspondence.

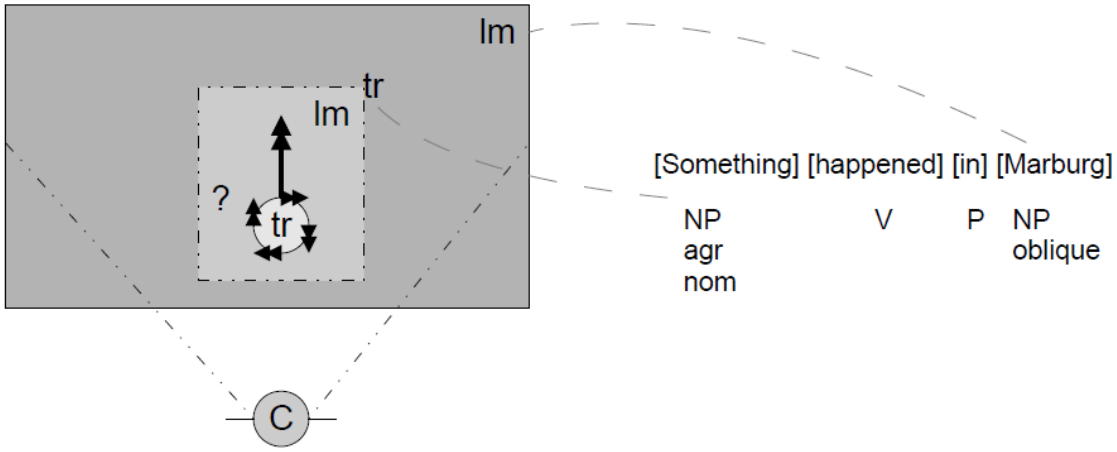


Figure 3.36: Correspondences between spatial conceptual structure and linguistic^{o} structure for (3.13) Something happened in Marburg

The syntactic structure of (3.13) is similar to what we have seen, but sentence (3.13) and the corresponding Figure 3.36 demonstrate the power of language especially clearly. Marburg functions as the landmark here against which something is specified, whereby "something" is seemingly functioning as the trajector here. However, "something" has a potential generality which is not achievable in sensation and eventually even in conceptualization. (As has been mentioned, there is no conceivable figure/ground configuration associated with *something* if this refers to the conceptualization ALEX FALLS OFF HIS BIKE IN FRONT OF THE INSTITUTE. We have seen, however, that trajector-landmark segregation is more flexible. How can a tr-lm configuration underlying (3.13) be specified, then? Taken as an instruction for a hearer and abiding by the rule that trajectors are realized as nominative NPs that agree with the verb, the hearer will interpret *something* in this position as anything that is conceivable as an object in sensation and conceptualization. However, the verb *happen* requires the expression for a whole event in that position, i.e., a whole trajector-landmark configuration instead of an object as trajector. Trivially (from a sensation perspective), an event is not an object and cannot be one, given the way in which objects have been characterized in previous sections. Even if conceptualization might be more flexible with respect to the trajector-landmark configuration than sensation is with respect to figure/ground configuration, it cannot make an event an object. (What this means for linking and for interpretation will be discussed in the rest of this chapter.)

To sum up, spatial conceptual structures of states, processes, and activities are reflected in the syntactic realizations of the respective circumstances in fairly regular ways. Possible generalizations based on the sample above are the following:

(i) The trajector-landmark asymmetry in conceptualization is reflected by an asymmetry in syntactic structure. The trajector is mostly expressed by means of a "privileged"[127] syntactic complement (PSC) – an NP – that bears nominative case (in German) and agrees with the verb. The landmark is expressed by other means, mostly by NPs in dative or accusative case or as part of PPs. What one finds here is an instance of diagrammatic iconicity (Peirce [2]1960, 1983: 64, Haiman 1980, 1983, 1984, Manning & Parker 1989): "An iconic diagram is a systematic arrangement of signs, none of which necessarily resembles its referent, but whose relationships to each other mirror the relationships of their referents." (Haiman 1980: 515). Thus, while a PSC does not necessarily resemble an instance of a trajector (in fact, it hardly ever does), and any other complement hardly ever resembles an instance of a landmark, the tr-lm configuration can be diagrammatically reflected by the syntactic configuration. In this sense, a syntactic structure can be said to be motivated (Saussure 1916: 186ff.).

To be sure, which object is trajector and which object/location is landmark is determined by the same factors that are operative in figure/ground segregation (see section 3.1.3.3). There is some optionality there, when more than one object is figure-apt.

There seems to be a strong tendency in German and English to make the trajector of a state, process, or activity the PSC. Is there any explanation for that? Remember what makes objects figure-apt. They are small and mobile relative to what else is there. In the section on salience it was shown that figures are also attention-grabbing (which correlates with eye-fixation and foveal seeing). Both aspects apply to trajectors, too (except that they receive attention because of their pertinence, not their salience). It is thus constitutive of trajectors that they need something like anchoring in space (their position relative to what else is there) and time (their position relative to their previous and next position) which can very well be considered an aspect of the now familiar large-scale law of closure. Anchoring trajectors contributes to closure in that an otherwise "free-floating" trajector is more or less definitely situated against a landmark. Crucially, this situating of the trajector does not only involve the landmark but also the relation holding between it and the landmark. This is the reason trajectors are preferred as privileged syntactic complements: Because of its inherent features the conceptualizer preferably follows the trajector's path with his/her gaze and produces a verbalization that is somewhat iconic with respect to the order of the event, pursued by means of the trajector. However, this does not exclude the possibility of making the landmark the PSC, as demonstrated, for instance, by *have*-possessives, certain verbs often treated as having recipient or experiencer subjects (e.g., *receive*, *get*, *obtain*, *recall*, *miss*, *need*), and passives. This corresponds to an alternation in the mode of conceptualization, but leaves the component parts unaltered. These cases will be treated here as inversed mappings. Concerning the respective conceptualizations, a state, process, or activity concept is built by

[127] The term is borrowed from van Valin (2005) who calls "privileged syntactic argument" what was traditionally called "subject". Van Valin rejects the subject notion.

conceptualizing some state of an object or a relation between objects in terms of (a) trajector-landmark configuration(s), in just the way described above and in previous sections. However, research in visual imagery has shown that cognizers are able to "examine" what I call concepts in different ways (cf. Thompson et al. 2008). Thus, when a concept has been built up, from an allocentric or egocentric perspective, the conceptualizer is able to examine the concept and thereby examine the spatial layout of the scene by changing his/her perspective. This could happen by scanning the scene in terms of simulated eye fixation on parts of the (complex) concept, starting at the landmark and proceeding to the trajector. Thus the verbalization can be iconic in two ways: It either respects the sequence of the trajector's positions through time relative to the landmark (e.g., NP *is in* NP's *hands*) or it respects the course of examination of the whole circumstance concept in terms of the path of the simulated eye gaze of the conceptualizer (e.g., NP *has* NP).[128] In the former case, we get a pairing of the trajector with the PSC and of the landmark with another complement. In the latter case, we may get a pairing of the landmark with the PSC and of the trajector with another complement.[129] Scanning a circumstance is even possible in the case of stative, i.e., simple circumstances – where the percept/concept does not have any sub-parts. Where this applies I will talk about fictive movement/motion (cf. Talmy 2000, I, ch. 2, Langacker ^{2}2002, ch. 5, on "fictive", and "subjective" motion, respectively).

(ii) The relation of trajector and landmark to one another is expressed by verbs or by verbs plus prepositions. A PP therefore incorporates part of the landmark and part of the relation which holds between the trajector and the landmark.

(iii) If trajector-landmark (tr-lm) configurations from different levels are expressed, the coding of the lower level respects (i) and (ii) (see Figures 3.34 and 3.35). The higher-level tr-lm configuration uses the lower-level tr-lm configuration as the trajector and mostly PPs as the landmark.

(iv) If a trajector-landmark configuration relates real possessors and possessees (i.e., relations going beyond mere location and factoring in alienability and part/whole relations), the syntactic realization may be shifted towards an inverse mapping (see Figure 3.28).

[128] Langacker handles this by means of two concurring concepts: trajector-landmark alignment and so-called "reference point relationships". The latter is reserved for situations in which it is necessary to "invoke the conception of one entity in order to establish 'mental contact' with another." (Langacker 2008a: 83). The first entity functions as a reference point for the second. At least to me it is not clear how trajector-landmark relationships and reference point relationships can be differentiated from each other. Wherever there is a reference point, it seems to me, this is – by definition – a landmark in the sense employed here. Langacker needs reference point relationships to account for the kind of "inversed" processing observable in possessives, for instance.

[129] At least with respect to passives we know that their interpretation takes longer and is less accurate than with the corresponding active sentences (cf. Ferreira 2003). It has been shown that this effect is not syntactically induced. It is a future task to test whether it is the landmark-PSC pairing which causes these effects.

(v) The organization of syntactic structures in terms of how parts of speech are arranged to form well-formed structures seems to be "blind" to the level of specificity/generality of some trajector-landmark configurations coded by a such a structure (Figures 3.24 to 3.36 work by the same syntactic rules and illustrate this nicely), but it seems to be "sensitive" to situations where trajector-landmark configurations from different levels of specificity/generality enter a single syntactic structure (as illustrated by the comparison of the conceptual structure-syntactic structure correspondences in Figures 3.34 and 3.35).

(vi) Among the circumstances which show special behavior with respect to their linguistic realization are are those allowing for alternative verbalizations, e.g., resemblance (*ähneln* 'resemble), commercial and other exchanges (*kaufen* 'buy', *verkaufen* 'sell), and so-called experiencer relations (*jmdn. vermissen* 'miss s.o.', *jmdm. fehlen* 'be missed by so.'). These verbalizations compete against each other with regard to the question as to which participant "object" concept is verbalized as the PSC: the trajector or the landmark. This competition can now be shown to have two possible sources: First, the objects involved are equally figure/trajector-apt, so they are equally good candidates for being realized as the PSC, and this is lexicalized in the respective verbs (resemblance, commercial exchange; cf. Fillmore 1977). Second, inverse mapping of a state, process, or activity is lexicalized (where the verbalization with *vermissen* is inversed in that the landmark is the PSC).

In the previous section I have already hinted at several shortcomings in the regularity of the relationship between spatial conceptual structure and syntactic structure. The most important ones are summarized here:

(vii) The conceptual trajector tends to but need not be syntactically realized as the PSC. This holds for two-participant relations (NP *has* NP) and for certain circumstance sub-parts in three-participant relations. As has been shown, in a ditransitive relation the transferred thing functions as both the landmark and the trajector in the course of conceptualization. In its role as trajector the transferred thing (as moving relative to the landmark of the addressee of the transfer) it is not realized as the PSC. This complicates acquisition for the language learner and interpretation for the hearer.

(viii) Syntax can compress what is actually conceptually uncompressed. When considering (3.10) once more, we find exactly this case. The syntactic structure makes us believe that there is a single relation holding between two objects (*Mario und Alex ähneln sich*). However, as I have outlined, there is no corresponding single relation in conceptualization (*MARIO AND ALEX RESEMBLE EACH OTHER). Rather, where language suggests a static relation there is actually a complex conceptualization process encompassing two relations at a time (MARIO RESEMBLES ALEX and ALEX RESEMBLES MARIO).

(ix) A related problem is that if one posits a tight (spatial) conceptual structure-syntax relationship, i.e., a systematic diagrammatic iconicity between both, then syntax makes us believe that nominal expressions code concepts of objects. This is clearly not the case. The reason why this is not the case is neither a methodical (semantic considerations have no additional explanatory value; cf. Chomsky ^{2}2002) nor a theoretical one (the mind is modularly organized; Chomsky 1986, 13), but an empirical one: In perception objects were characterized by recourse to the integration of features into figures and the segregation of figures from grounds. In conceptualization we have seen that this same organizational principle (in terms of trajector and landmark) is more flexibly applicable because the conceptualizer is not subjected to vantage point limitations in conceptualization to the same degree as in actual perceptual situations. What is the biggest possible object in conceptualization, then, when we apply the perceptual definition of object to conceptualization? Is [Alex falling from his bike] a possible object in conceptualization? Is [Alex falling from his bike in front of the institute] a possible conceptual object? Is [the discrimination of women in Wilhelmine Germany] conceptually an object? The answer must be a clear "no" in all cases because these units refer to whole circumstances that have temporal extension. They do not have object features, although they can all be verbally expressed by a single pronoun, as in *[This] happened in Marburg, too*. The consequences for the syntax-semantics relationship as well as for the linking competence (especially interpretation) will be the topic of the subsequent chapters.

Before we can turn to the question of how these shortcomings can be handled in the context of a theory of the syntax-semantics relationship, the abovementioned correspondences and discrepancies between sensation, conceptual structure and syntactic structure are sketchily summarized in Figure 3.37.

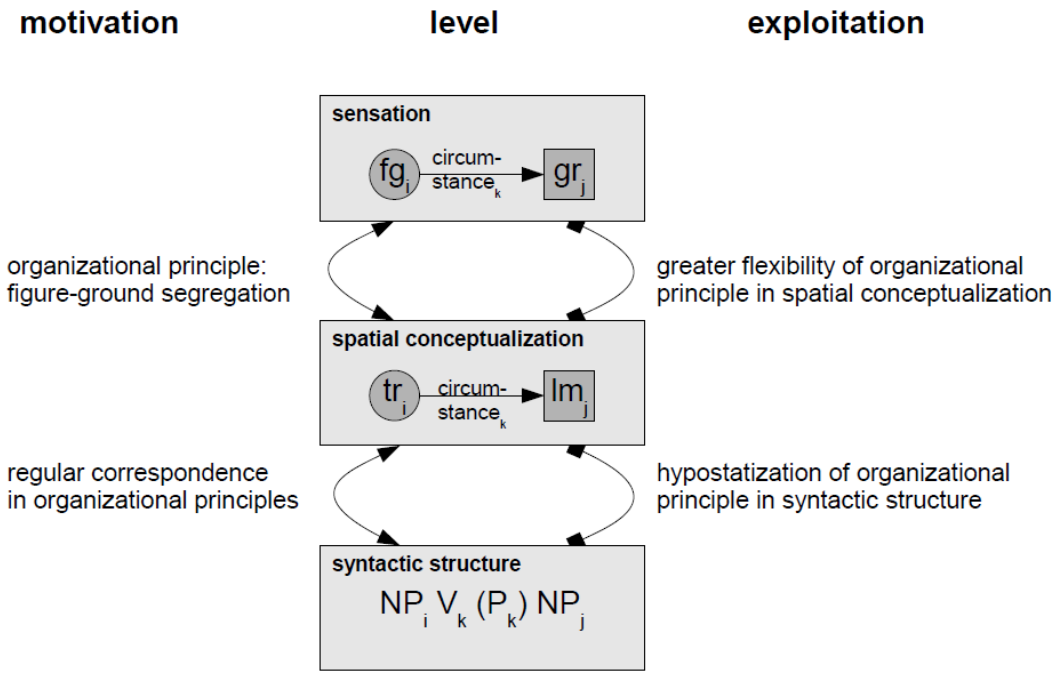


Figure 3.37: Correspondences and discrepancies in the relationship between sensation, spatial conceptualization, and syntactic structure

Figure 3.37 illustrates that sensation and spatial conceptualization share their organizational principle: the segregation of the visual/conceptual field in terms of figure/ground and trajector/landmark, respectively. This is indicated by the double arrow connection the levels. In these respects, the two levels are iconic relative to each other. There is a difference in quality, however, in how they make use of this organizational principle. While sensation meets a bodily, i.e., anatomical, biophysical limit in what can function as figure, the character of conceptualization as a simulation – which is not bound to actualities – allows it to take any conceivable vantage point to look at some state of affairs and to apply trajector-landmark segregations on higher levels of generality than in most cases of sensation. This happens at the expense of the definiteness, or individuation, of objects (see next section). That the two levels diverge in this respect is indicated by the absence of arrows in the line connecting them. Quite similar to the relationship between sensation and spatial conceptualization, the latter stands in a close relationship also with syntactic structure in that there are regular correspondences between their organizational principles (diagrammatic iconicity). The parts of speech identified by linguists are arranged in a way in syntactic structures which demonstrates a fair correspondence with the spatial conceptual notions of trajector and landmark: The trajector is coded by the privileged syntactic complement, the circumstance is coded by the verb (plus preposition), and the landmark is coded by an oblique complement.

On the other hand, we have seen that in using language, speakers tend to exploit these correspondences between both levels in that they code some conceptual contents as if they were object-like, although actually they are not, e.g., the PSC or the oblique complement code whole circumstances instead of objects in the perceptual and conceptual sense. In doing so the same means of the symbol system are utilized to code conceptual structures of different sorts, e.g., objects and circumstances. One could term this type of language use hypostatization:

Speakers treat circumstances as if they were objects in the sense outlined in the sections on sensation (see also Foley 1937; Mackenzie 2004; Hartmann 1996, 2006; Hartmann & Lange 2000; Janich 2009).[130] Without pursuing this much further here, and without claiming explanatory adequacy, sensing an object that makes a "good" figure and making this the trajector in identification/conceptualization, and then coding it as the PSC in syntax presumably constitutes maximal "nouniness" some part of speech can acquire. But the more the syntactic level exploits the mode of functioning of the conceptualization level, the less "nounier" this part of speech will become. This could be one of the causes of the cross-linguistically observable syntactic category squishes: Some nouns are nounier than other nouns. The present proposal gives a partial explanation of the non-trivial fact that concrete, perceptible things are the nouniest nouns if expressed by nominals (cf. Sasse 2001 for an overview). Since it takes motivation to be primary to exploitation, the present proposal furthermore predicts that if a language hypostatizes states, relations, quantifications etc. by using nominal expressions for them, it also has nominal expressions for "true" objects in sensation/conceptualization.

To sum up, while the relationship between the concept ALEX and the expression *Alex* is arbitrary, and while the relationship between the conceptualization of A BALL ROLLING INTO A ROOM and its expression as *The ball rolls into the room* is one of motivation due to diagrammatic iconicity, the relationship between the conceptualizations ALEX RESEMBLING MARIO and MARIO RESEMBLING ALEX, and its expression by compression as *Mario und Alex ähneln sich* is one of exploitation.

3.3.3 Hypostatization and the relationship between trajector/landmark and thing/circumstance

Clearly, it is hypostatization in the form of exploiting the organizational similarities between conceptualization and syntax which allows speakers to make utterances like *Unemployment threatens the youth in Spain*, *I have a headache*, or *The immune system fights off disease* (last example by Lakoff & Johnson 1999: 217), utterances we hear and produce every day, since the underlying mechanisms have become second nature for us.[131] Though, when looking at these utterances we see that maximum the referent of *I* may constitute an object in the now familiar sense (if identified with the body). Unemployment, the youth, a headache, the immune system and disease are clearly not objects but – very roughly – features of objects or

[130] Foley (1937: 491f.) characterizes hypostatization as "the frequent tendency to consider purely conceptual constructs as real substances or forces, i.e., to make them into and to regard them as separate, distinct, actual, or personal existences." However, the problem seems to lie even deeper than this. In the view taken here, what is hypostatized is not even "purely conceptual constructs", but purely linguistic^{o} constructs considered thing-like in conceptualization by speakers (among them scientists, especially in faculty psychology). Hartmann (1996: 325f.; my translation) describes the problem more properly by stating that "objects [Gegenstände], postulated at the level of theoretical constructs, are in their methodical status no longer differentiated from objects on the phenomenal level, and thus subsumed with them in the domain of the physical." In doing so one ignores the fact that objects at the level of theory are – in contrast to objects at the level of phenomena – not accessible and traceable independently from the theories in which they occur (cf. Hartmann 1996: 326). Hypostatization is without question a universal or nearly universal property of language but must be avoided in scientific theories. Often, nominalizations may be unproblematic. But in other cases they generate philosophical/scientific pseudo problems: While "movement" allows questions as to its beginning, end, direction, and so on, it not necessarily possible to state synonymous questions by using the verb "move" (cf. Janich 2009: 128f.).

[131] Indeed, *make an utterance* is also an instance of hypostatization, as is *hypostatization*.

states "in" which objects "stand". Other examples of non-objects occupying trajector positions are locations (*I love the countryside*), activities (*Waiting makes me angry*), and events (*Akira caused the destruction of the city*). Nevertheless, they occupy syntactic positions which should – presupposed that motivation by diagrammatic iconicity is by default desired – be reserved for trajectors and landmarks, which we should be able to trace back to objects of perception, if the theory is adequate. So, how can these considerations be accommodated? I propose that one can approach that problem by taking into account at least three factors: the notion of conceptual metaphor, affordances (as introduced earlier), and the interactive and the practical functions of language as competing motivations.

3.3.3.1 Conceptual metaphor and the status of target domain "concepts"

One source of hypostatizations is conceputal metaphor. The central idea underlying the notion of conceptual metaphor (originally Lakoff & Johnson 1980, 1999, 2002) is that we use domains of sensorimotor experiences (the scope of which are defined by our sense-organs; see section 3.1) in order to conceptualize and verbalize matters for which we do not have any means of direct bodily experiences but which nevertheless concern us. That they concern us means that they are pertinent for engaging in the physical and social world around us. They thus force us to differentiate them by means other than perception. Prominent examples are the metaphors TIME AS SPACE, according to which we conceptualize matters of time by means of the space concept (e.g., *the future is in front of us*, *the past behind us*, *time passes by*, *we are approaching the final days* etc.), KNOWING IS SEEING, according to which we conceptualize the domain of knowing by that of seeing (*to shed some light on sth.*, *to get clear about sth.*, *the era of enlightenment*, *I see* etc.). One crucial feature of conceptual metaphors is that the mapping from a source domain (sensorimotor) to a target domain (not sensorimotor) not only comprises punctual correspondences but whole inference structures, i.e., we are able to reason (i.e., simulate speaking) about some target domain by utilizing the means of the source domain because what is mapped is whole domains with rich internal structures. At the same time it is important to note that the target domain "concept" is not identical to the source domain concept, i.e., time is not space, and knowing is not seeing (see, for example, Murphy 1996, 1997, Rakova 2002). This non-identity shows up in the limits of the cross-domain mappings, for instance. In the context of the TIME AS SPACE metaphor there is a sub-mapping in which we move through time towards the future as we move through space towards some destination. When we have missed the exit on the road we are clearly able turn around and to drive back and take it. When we have missed an opportunity (which is a temporal notion), we are not able to turn around to go back and take it. Rather, the opportunity may occur again. This is also the reason why there are multiple metaphors for one target domain the inference structures of which may interfere strongly (cf. Murphy 1996: 184ff.).[132] If one takes the idea of conceptual metaphor seriously, one must presumably state that target domains cannot have a topological structure on their own (ultimately originating in an retinal image) if they borrow the structures of different source domains at the same time which might logically exclude

[132] In introducing the TIME AS SPACE metaphor I have given one example of the MOVING TIME metaphor and one of the MOVING EGO metaphor. This is an example of multiple metaphors for a single target domain. Murphy's example is LOVE: LOVE IS A JOURNEY, LOVE IS AN OPPONENT, LOVE IS INSANITY etc.

each other. That is, target domains do not have a spatial conceptual structure the origin of which would have been constituted by sensorimotor experience. This in turn means they do not have an internal trajector-landmark organization but must "borrow" it from concepts which do have one. The discussion is still going on about whether target domain concepts have their own structures, and if they do, how they can be characterized and described. Although I will not be able to answer these questions, I will propose the following treatment of conceptual metaphor with respect to our problem of the hypostatization of concepts through language: The "concepts" constituting target domains in conceptual metaphor theory – time, emotion, the mind, action, social relations, etc. – are without doubt matters which concern us, i.e., our engagement in our environments, our engagement in our lifeworlds and the organization of our living together. As such we are forced to differentiate them. We cannot do this by means of sense organs. But because they are of huge practical relevance for us, we need to reason (simulate speaking) about them, communicate them and transduce them into instructions for action. I think we accomplish this in the following way: Let us take the example *I have a headache*. A headache is clearly not an object and there is no spatial configuration which would be "visible" in someone suffering from an ache in the head. However, there may be a similarity in having an object at one's disposal and suffering ache in the head, namely the experience that it is "at" or "in" one, that both relations are mostly of limited temporal extension, that it comes and goes, that one has to deal with it once it is there and so on. This does not mean that HAVING A HEADACHE has no own internal structure, whatever it might be like. Where there is similarity, there must be something to be similar. Headaches might upon reflection "seem like" having things at one's disposal (i.e., possession) in the abovementioned respects. It might feel like some other concepts in other respects, depending on the actual communicative or other purposes of the cognizer, depending on the aspect he/she is attending to. In the same vein time might be conceptualized as moving, or the conceptualizer might be conceptualized as moving, dependent on his/her actual purposes. In other words, target domain "concepts" are actually no concepts because they do not simulate anything (hence the quotation marks) but borrow simulations from other, sensomotorily based domains. They appear to be similar to familiar sensorimotorily based concepts in certain respects and so conceptualizers reason and talk about them in the way they reason and talk about familiar concepts. In order to talk about these things and make them operative for action we have to borrow manners of speech from (other) conceptual domains. Depending on the multiple purposes one can pursue it is to be expected that conceptualizers make use of the verbalization strategies of various source domain concepts in order to structure the target domain "concepts". Speech communities determine which source domains are utilized to structure target domains in the linguistic^{o} conventions of a given language (cf. Boroditsky 2001 with respect to different conventions in the conceptualization of time). It is also expected that different speech communities avail themselves of differing conventions to structure their non-sensorimotorily based "concepts", although their experiences with pain in the head, time and so on presumably feel similar. Children born into such an environment in which verbalization strategies concerning non-sensorimotorily based experiences are practised are forced to associate conceptualizations with verbal utterances. Thus, they also are forced to associate conceptualizations with verbalizations concerning target domains. This makes children routinize reasoning (simulated speaking) about these domains in terms of

other (i.e., source) domains. In acquisition children therefore need not re-invent or motivate a metaphor in order to acquire appropriate ways of talking about them. Within constellations of joint attention they need only learn the conventions and conditions under which someone utters it, perhaps first gaining insight into its motivatedness long after having begun using it themselves (cf. Bruner 1975, Clark 2003, Tomasello 2003). Nevertheless, it is possible for a person to acquire the contingent conventions of a foreign speech community regarding which universal (since they are sensomotorily based) source domains are used to organize which target domains.[133] Because, for example, time cannot underlie simulated perceptions but in certain respects feels like moving through space, languages may differ in the extent to which they exploit this similarity linguistically^{o}. One can demonstrate this with headaches and possession: While in both English and German you can *have and get a headache*, only in English can something *give you a headache* (example from Lakoff & Johnson 1999: 196). In "concrete" language, i.e., in talking about things underlying source domain concepts like FISH, BOOKS, and MONEY, the extension of "givable" things is the same for German and English speakers.

In sum, one source of such hypostatizations is that because talking about target domains is required, we make use of verbalization strategies that are associated with source domain concepts. By doing so, we impose trajector-landmark configurations on matters that actually do not exhibit a trajector-landmark organization on their own.

3.3.3.2 Affordances again

Hypostatized circumstances not only occur in syntactic positions that should be reserved for concepts of more object-like entities, they also seem to behave differently syntactically. An example would be that given in (3.14):

(3.14) *Der gestrige Tag hat wieder viele Stürze von Fahrern gesehen.*
The previous day has again many accidents of cyclists seen
lit. 'The previous day saw accidents of many cyclists again.'

(3.14) could be a headline commenting on a normal *Tour de France* day. Inserting more object-like entities in the complement positions would result in something like (3.15):

(3.15) *Der Priester hat viele Jungen gesehen.*

[133] The mere presentation of different ways in how different speech communities conceptualize time in, for instance Lakoff & Johnson (1999, ch. 10), Radden (2003), or Evans (2004) strongly suggest the validity of the learnability thesis. If these conventions were not learnable or accessible by speakers of other languages, these presentations in textbooks would not have been possible (unless they are incorrect). This is also the reason the strong Whorf-hypothesis (cf. Whorf 1956) cannot be right: Whorf would not have been able to characterize the Hopi language and its underlying conceptualizations if his hypothesis (in its strong reading; cf. Evans & Green 2006: 96ff.) was right. Thus, our conceptual systems are broadly compatible with each other in the sense that approximately similar conceptualizations are in principle possible. However, relativity, or better: complications, reside somewhere else, namely in the mappings between conventions of borrowing verbalization strategies with respect to target domains and cultural praxes which are effects and grow out of these conventions, and where these mappings are not transparent (cf. Foley 1997, ch. 10).

The priest has many boys seen
'The priest saw many boys.'

Now it is remarkable that the passivized version of (3.14) would presumably be rejected by most speakers of German as inappropriate in any possible context. In contrast, the passivization of (3.15) is certainly grammatically well-formed and appropriate in many contexts.

(3.16) #*Viele Unfälle von Fahrern sind vom gestrigen Tag gesehen worden*.
Many accidents of cyclists are by-the previous day seen were
lit. 'Many accidents of cyclists were seen by the previous day.'

(3.17) *Viele Jungen sind vom Priester gesehen worden*.
Many boys are by-the priest seen were
'Many boys were seen by the priest.'

Although the sentence pairs show identical syntactic structures, their behavior differs. My proposal for an explanation of this phenomenon is that (a) one has to consider object affordances again and (b) ask for the factors that restrict passivization. (a) Affordances concern the question of what objects afford to perceivers and conceptualizers, i.e., what objects "tell" them about the circumstances in which they may stand on the basis of their identified features (see section 3.2.1.2). We are concerned here only with the affordances of the conceptualized "objects" underlying the PSC positions in the active sentences.[134] Consequently, we must ask what a day affords to a perceiver/conceptualizer and the answer must clearly be "nothing". Affordances are the circumstances of objects that a conceptualizer identifies to be possible or actual states, processes, and activities on the basis of a simulated percept. A day simply does not make retinal images, and therefore cannot function as a simulated percept. Therefore a day has no affordances. A consequence of this is that it also cannot be part of causal relations (as defined in section 3.2.1.3). One might now ask where the causal relation in seeing something is. But our "concept" of seeing also makes use of a conceptual metaphor, namely SEEING IS PHYSICAL CONTACT (cf. Lakoff & Johnson 1999: 398f. for discussion). While a priest affords CAUSATION (which has been characterized in section 3.2.1.3 by recourse to physical contact), a day does not. (b) Passivization of a sentence is mostly – and across grammar-theoretic frameworks – explained and restricted by recourse to one or the other form of a thematic hierarchy (e.g., Jackendoff 1972, Dik 1997, Langacker 1987 et sqq., Goldberg 1995, Grimshaw 1990) or the hierarchy between generalized thematic roles (e.g., Primus 1999, van Valin 2005). The basic idea can be condensed to the generalization that the PSC in the active must be (close to) agentive (however defined), that the other complement(s), if present, must not range higher on the thematic hierarchy, and that there must be some causal relation between the participants coded by the complements. To anticipate my later treatment of passivization, I am largely consonant with these proposals, but will reconstruct thematic roles and their hierarchization from spatial conceptual structures

[134] Replacing *gestrigen Tag* 'the previous day' in (3.16) by *Priester* 'priest' would make the sentence well-formed.

(including affordances) and from actional knowledge (see also Appendix A). Because the PSC referent in (3.14) does not afford anything, it takes no "position" in whatever thematic hierarchy and does not participate in a causal relation. Therefore, its passive variant is predicted to be ill-formed.
This explanation obviously conceals why a conventional linguistic[o] pattern in which "days see something" should develop, at all. I cannot accomplish this here, but I would suppose that conceptual metaphor plays a role, i.e., that *day* is conceptualized by means of some source domain with which it shares some aspect of experiencing it, whereby the target domain from which *day* comes does not provide us with spatial conceptual structures.

3.3.3.3 Competing motivations, instances, and generalizations

The matter of hypostatization becomes really complicated when looking at nouns and noun phrases like *unemployment*, *the destruction of the city*, or *all men*, where the underlying concepts concern temporally extended properties of (a) person(s), temporally extended processes in which some higher-order object loses its integrity (as caused by something), and where each and every member of the category MAN is designated, respectively. Can whatever is coded by these noun phrases conceptually afford anything, e.g., by inheriting the affordances of some possible source domain from which they borrow their spatial structure?
When looking for conceptual correlates of parts of speech it is worth looking at how Langacker (1987 et sqq.) and Talmy (2000, I, ch. 1) treat these cases, since they are the authorities in the field of cognitive semantics.
According to the "content requirement", a strong working hypothesis in Cognitive Grammar, "the only elements ascribable to a linguistic system are (i) semantic, phonological, and symbolic structures that actually occur as parts of expressions; (ii) schematizations of permitted structures; and (iii) categorizing relationships between permitted structures." (Langacker 2008a: 25). The content requirement implies that grammar consists of symbolic assemblies and only them. Thus, the difference between *destroy* and *destruction* must not only reside in their phonological poles but also in their semantic poles (for the following see Langacker ^{2}2002, ch. 3). By semantics Langacker first of all means conceptual content and second of all how this content is "construed". *Destroy* and *destruction* have identical conceptual content but are construed differently. The verb – describing a process – construes the event by means of "sequential scanning", while the noun construes it as a thing by means of "summary scanning". That means the process underlying *destroy* is construed as "a series of component states scanned sequentially through conceived time" (Langacker ^{2}2002: 98), whereas in the construal underlying *destruction* "the states are still accessed in their natural sequence", but "undergo summation: that is, they are mentally superimposed, resulting in their simultaneous activation. […] The end result is that all the component states are simultaneously active and available." (Langacker 2008a: 111). Taken together, a noun profiles a thing and a verb profiles a process, where the profile is the particular substructure of the visual field on which the viewing attention rests (cf. Langacker 2008a: 66). This can be summed up by stating that in Cognitive Grammar the nominalizations we are talking about indeed have distinct conceptual import in that nouns construe states of affairs in a thing-like fashion thanks to summary scanning and grouping together.

In Talmy's (2000, I, ch. 1) account, the domains of space and time share fundamental properties in that they allow quantification (*two miles*, *fifty hours*) and so on. Because of that

> "a verb root that lexicalizes expression of an act or activity as a temporal quantity can be associated with grammatical forms, including nominalizations, that signal a cognitive operation of reification. By the semantic effect of this operation, the referent becomes conceptualized as an object or a mass, one that can participate in many of the same actions – such as being given or gotten – as a physical quantity […]." (Talmy 2000, I: 43)

Taken together, Langacker and Talmy take reification to be a real cognitive activity and not just a linguistic^{o} activity. That is, producing or interpreting a nominalization of a relation or feature corresponds to a conceptual process in which a relation or feature is treated as an object. I deem this treatment of nominalization problematic.

Both Langacker and Talmy leave open what "thing"/"object" means outside conceptualization (maybe because they stick to a bilateral linguistic^{o} sign); they seem to presuppose a prescientific understanding of the term. Otherwise one would be forced to conclude that an object is what is scanned in a summary-like fashion and grouped together (Langacker) or reified conceptually (Talmy) which is clearly circular. In any case the relation between circumstances (states, processes, and activities) and things is unspecified, i.e., we do not know what constrains the processes of reification/summary scanning and the reverse processes of "actionalization" (Talmy 2000, I, ch. 1), and sequential scanning and grouping together (Langacker). Why are linguistic^{o} expressions not arbitrary in most languages with respect to what is expressed by nouns or verbs, if both space and time share so many properties that one can construe nearly everything as thing or circumstance? What is it that is thing-like in the concept RECIPE (which is not the paper on which it is written) when its component steps are grouped together by summary scanning? (example from Langacker 2008a: 107)? These are important questions that both proposals largely leave unexplained.

It seems to me that both Langacker and Talmy take the idea that language is a window to cognition very seriously. Otherwise the symbolic thesis and the content requirement would not be feasible working hypotheses. To me it seems as if they believe their eyes too unquestioningly when looking through the language window. This forces one to look for conceptual correlates of linguistic^{o} phenomena where there might potentially not be any. For instance, Broccias & Hollmann (2007) have recently called into question the feasibility of the scanning modes Langacker postulates, because they lack theory-independent evidence. Langacker (2008b) has responded and defended the concept on the basis of rather subjective phenomenological and theory-dependent (Cognitive Grammar) arguments. Moreover, Langacker admits that there is at the present time no independent evidence for the notion, although elsewhere he strongly emphasizes his search for converging evidence when claiming theoretical concepts (cf. Langacker 1999: 26ff.). When looking into cognition through other than linguistic^{o} windows as is attempted here by means of a multidisciplinary account, one becomes sceptical with respect to the cognitive reality of the processes "underlying" nominalization, reification, or hypostatization.

I will try to demonstrate how a proper treatment of hypostatization follows from the theoretical and research-programmatic tools I have been developing so far: I have characterized conceptualization as simulated perception. I have also outlined that we perceive those features as features which we differentiate as being salient or pertinent with respect to

our lifeworld activities. Keeping this in mind, we can first state that there can be no objects in conceptualization which could not potentially serve as objects in perception. Otherwise they would not be concepts by definition. It has been demonstrated, however, that conceptualization exploits the figure/ground segregation of the visual field with greater flexibility. That does not mean that conceptualization can make thing-like what is not thing-like in perception but that the conceptualizer can take vantage points in conceptualization which perceivers take very infrequently if at all. So maybe someone has never seen Marburg from above such that he/she could have segregated it as a figure from a background. But the person is able to conceptualize, however vaguely, Marburg as exhibiting object features when taking a vantage point in the sky. The range of conceptual contents is restricted by the range of possible perceptions, such that the range of possible objects in conceptualization is restricted by what is a potential object in perception (or, to be more precise, sensation).

Secondly, it has been shown that there are regularities between spatial conceptualizations and how they are syntactically coded. However, there are syntactic structures which only "pretend" to code trajector-landmark structures, while they actually do not because what they seemingly code as trajector cannot serve as a potential object in perception. Exploitation in this sense is possible because the functioning of syntax can in principle be contingent on conceptualization (cf. Bierwisch 2008). In other words, syntax exploits perceptual/conceptual organization, because in principle its mode of operation as a symbol system allows this. Motivation in the form of diagrammatic iconicity illustrated above is not a logically necessary relationship between form (syntax) and content (conceptualization and actional knowledge), but only a psychologically desirable one, for the sake of learnability. A basic idea of the Instruction Grammar proposed here is that the (syntactic/grammatical) organization of an utterance is something like an instruction for simulating a perceptual experience on the side of the hearer. As is well-known, not everything about the conceptualization that the speaker wants to share is relevant for a given discursive purpose (cf. Grice 1975). Hence, there is quite an economically driven need for a strategy to minimize or reduce utterances (or "domains"; cf. Hawkins 2004) without developing new combinations of syntactic units which would undo the economic effect right away (cf. Haiman 1983). So, why not take the well-motivated (by diagrammatic iconicity) clause structures (where the PSC codes the conceptual trajector and another complement codes the conceptual landmark) and exploit them for economic purposes. Such considerations make *The destruction of the city caused unemployment of the inhabitants* out of many clauses in which possible objects in conceptualization occupy the positions of the PSCs and oblique complements, respectively.[135] In interactions in which such a compressed sentence is well understood it is not of relevance who destroyed the city, which city, how this happened in detail, when this happened, who exactly became unemployed, unemployed of what and so on, or it is already known by the interlocutors (cf. Piantadosi, Tily & Gibson 2012). To utilize Bickel & Nichols' (^{2}2007) notion of indexicality, the level of specificity in

[135] Obviously, *destruction* and *unemployment* as nominalizations reduce the syntactic valence of the underlying verb *destroy* and the adjective *unemployed*. But in order to conceptualize the nominal expressions the objects involved in this relation and this state (the conceptual "objects" DESTROYING and DESTROYED and BEING UNEMPLOYED), respectively, must nevertheless be conceptualized. So the reduction is only one of form, not (to the same degree) one of conceptualization. Actually, the conceptual valence of a relation often seems to be higher than its syntactic valence actually is (cf. Heringer 1983, 1985).

this utterance suffices for the interlocutors in order to be able to identify the referents, or the referents simply need not be specific.

Thus, at its core hypostatization has an aspect of motivation and one of exploitation at the same time. It is motivated by economic considerations, and it exploits the diagrammatically iconic relations between conceptualization and syntax.

From the utterance-as-instruction-for conceptualization perspective of Instruction Grammar, an utterance like *Alle Männer fallen in Marburg vom Rad* 'All men fall off their bikes in Marburg' is an instruction to conceptualize, one after another, each and every man falling from his bike, respectively.[136] From a maxim-of-quantity perspective it is clear that not any single man is relevant here and that the full-conceptualization-instruction need not be executed, which would take the following form: "Take the first man and conceptualize him as falling off his bike in Marburg. Take the second man and conceptualize him as falling off his bike in Marburg. Take the third man…"[137]

It follows that there is no one-to-one correspondence between utterances including nominalizations or quantifications and unique conceptualizations for these utterances, such that conceptual trajectors could correspond to parts of speech like *all men* or *unemployed youth* or *the destruction of the city*. Or, to put it differently, there is, for instance, no unique ALL concept underlying the expression *all*. How can the appropriate use of *all* be learned, then? Imagine yourself as a two-year-old child who wants to have one of the uncountable marbles in front of you. Your six-year-old brother knows this and says *All marbles are mine*. You do not know what *all* means and try to get the blue marble right in front of you. You get your wrist slapped. So you try the green one. The same happens again. You try the next one and get slapped once more. Eventually you conclude that for any given marble you touch your brother will punish you. Next time any one says *All x are y* you know that you need not apply y to any given instance of x but that it does not matter which x you take, y is applies to it. And now that you are a person interested in language and read *All men are mortal* you do the same without requiring a unique ALL concept.[138]

In the introduction to part I language was said to organize (and co-constitute) praxes. At the same time it must serve what Langacker (e.g., 1999) calls a semiological function, i.e., coding conceptualizations.

It can be stated now that the diagrammatic iconicity between conceptualization and syntactic structure is motivated by the semiological function (ideally, a biunique conceptual structure-syntax relationship), while the exploitation of conceptual mechanisms by syntax through hypostatization is motivated by its practical function ("interactive" in Langacker 1999):

[136] This sentence exhibits a distributive meaning of *all* in which there is a bike for each man, not a collective meaning in which all men fall from one bike which could make *all men* a potential figure/trajector, i.e., a potential object (cf. Brooks & Braine 1996 for details).

[137] There is typological evidence that such (logical) conjunctions, expressed here asyndetically, may indeed lie at the heart of universal quantification. Conjunctions and universal quantification are grammatically, lexically, or otherwise related in so many languages that it cannot be due to chance (cf. Gil 2011).

[138] Here, *all* exhibits a collective meaning such that *all marbles* could potentially refer to a unique figure/trajector.

For understanding *all x* and for acting accordingly there is no unique ALL concept necessary. Similarly, generic, general or non-referential statements are hypostatizations and they are part of language, since they prove useful in the practical function of language. Utterances coding individual states, processes, and activities are mostly motivated (see examples (3.1) to (3.12) above), since they prove useful in making mutual conceptualizations possible.

If the present treatment of hypostatization, i.e., exploitation, is right, then one would expect that hypostatized instances of language use are acquired later and are dispreferred in language processing than motivated instances. Obviously, nouns that are not concrete (i.e., that cannot in principle be experienced by our senses) and nouns that are derived mainly from adjectives and verbs are treated here as instances of hypostatization. And there is indeed evidence in the psycholinguistic, neurolinguistic and typological literature that support the present proposal: Abstract nouns are acquired later than concrete nouns in language acquisition (e.g., Bassano 2000 for French); the acquisition of nominalizations is finished considerably later (eventually as late as age 15 in Hebrew) than that of non-derived nouns (cf. Ravid & Avidor 1998); different frequency bands are involved in memorizing concrete and abstract nouns indicating that they are processed differently (cf. Weiss & Rappelsberger 1996); concrete nouns are named faster in word-naming tasks (cf. Strain, Patterson & Seidenberg 1995); nouns without an argument structure are produced faster than nouns with an argument structure (Collina, Marangolo & Tabossi 2001); concrete nouns are recognized faster in word recognition experiments, are better recalled, their meaning is accessed faster in sentence comprehension (cf. Paivio 1991) and in lexical decision tasks (cf. Kroll & Merves 1986); abstract nouns in opposition to concrete nouns show activation in brain areas previously associated with verbal working memory, whereas concrete nouns activate those regions commonly associated with imageability (cf. Binder et al. 2005). *All* in its distributive meaning (where the quantified referents do not constitute a single figure/trajector: *Alle Männer fallen in Marburg vom Rad*) is acquired later than *all* in its collective meaning (where the quantified referents potentially constitute a figure/trajector: *All marbles are mine*; cf. Brooks & Braine 1996) and seems to occur only in those languages which also have *all* in its collective meaning (cf. Gil 1995). Results like these are concordant with the above assumptions according to which there is no possible unique concept associated with hypostatized nominal expressions (abstract nouns, deverbal nouns, deadjectival nouns, NPs containing universal quantifiers with distributional meaning), and this is due to their lack of figure/trajector-aptness. For understanding *unemployment threatens the Spanish youth* more extensive conceptualizations are necessary: In order to be able to simulate any perceptual experience and evaluate its practical relevance it is – presumably – necessary to trace *unemployment* back to some concrete object (person) which exhibits this property and to trace *Spanish youth* back to some concrete members of this category. When you hear the string *threatens the Spanish youth* you must also know that irrespective of which young Spaniard you take, he/she will exhibit the property of being threatened by unemployment, similar as in the case of *all marbles above*. If *unemployment threatens the Spanish youth* is literally, or better, faithfully taken as an instruction for a conceptualization, this is again impossible. It is rather the instruction: Conceptualize this as far as we both know that it is sufficient in our present discourse and infer the practical relevance of it. Understanding is clearly easier for *a dog threatens the child*.

It must be noted at this point that there is obviously some evidence as to differences between nouns that designate thing concepts and nouns that do not, but that very little is known about the meaning of, i.e., the concepts underlying, the latter. What is claimed here is that hypostatizations seem to be more demanding with respect to the linking between syntax, conceptualization, and action.

3.3.3.4 How linguistic^{o} hypostatization feeds back to conceptualization

If hypostatization is indeed motivated practically in that it reduces phonetic material of an utterance (e.g., by reducing the syntactic valence of an element in the case of nominalizations (*destroy* vs. *destruction*)), while it makes successful communication possible at the same time, this does not mean that it does not have an effect on conceptualization. Hypostatization compresses what is conceptually uncompressed, and this may lead to a less detailed conceptualization due to its linguistic^{o} compression: *the destruction of the city* will presumably be conceptualized in a less detailed manner than *Akira destroyed the city*, since for the former there is no need to put much cognitive effort in conceptualizing the destroyer. Similar effects have indeed been observed for progressive vs. perfective verbs (*John painted houses last summer* vs. *John was painting houses last summer*), where speakers conceptualize more details in progressives than in perfectives (cf. Matlock 2011), or with the linguistic^{o} coding of spatial conceptualizations which are described in the next section.

3.3.4 The status of spatial schemas: what relational expressions designate

In living our lives and pursuing our goals and interests in everyday life it is of prime importance that we are able to conceptually bring order to what happens around us. By doing so we acquire the ability to predict to a certain degree how particular states, processes, and activities will work out in the future, so we can attune our acts to them. If we are able to identify similarities among different instances of states, processes, and activities, and if we have observed that often types of these states, processes, and activities develop into others, then we are able to predict by generalization that this will often or always be the case. This would be an effective means for realizing purposes more successfully in the future. The central question about how this works concerns the nature of the identified similarity between states, processes, and activities. Obviously, most of what happens around us is unique. Every instance of the ball rolling into the living room when my nephew is playing will differ from any other instance in some respects, and so does John's pouring water into a glass (see (3.1) and (3.7)). The similarities are produced by my treating all those instances as being instances of the same action or motion schema, respectively. Merely by uttering "The ball rolls into the room every time my nephew plays" I prescind from those features[139] which make these events differ from each other. By substracting their distinctive features (in dependence of my present purposes) I construe some "schematic" similarity between them. When I talk about the ball rolling into the room in this way, I render distinctive features irrelevant, maybe because I utter it in the context "The ball rolls into the room every time my nephew plays, and that amuses

[139] Remember that features are features thanks to differentiation performances due to salience and pertinence.

me". It is irrelevant in this context, for instance, whether the ball rolls into the room describing a curve or whether it follows a straight line.
This is an example of how schematizations are produced by treating specific circumstances alike linguistically^{o}.

But true to the motto "There is nothing in language that was not first salient or pertinent in perception, action, and behavior" (e.g., Clark 2004, Casasola 2008), the primary instance of producing schematizations is by making differentiations in doing, i.e., by acting or behaving similarly towards slightly differing configurations of the things in the environment. As Johnson (1987: 29) puts it, "[a] schema is a recurrent pattern, shape, and regularity in, or of, these ongoing ordering activities". Linguistic^{o} activity is only one possibility.

It seems that the differentiations we make with respect to location states and motion events are similar across many cultures but that means of linguistically^{o} coding these relations differ: For instance, Korean and English speakers code similar spatial relations differently: For Korean speakers the critical features in the spatial relationship between two things seems to be TIGHT FIT vs. LOOSE FIT, and within LOOSE FIT we find te opposition LOOSE CONTAINMENT vs. LOOSE SUPPORT. For English speakers the critical features are CONTAINMENT and SUPPORT, irrespective of TIGHT FIT and LOOSE FIT (cf. Bowerman 1996, Bowerman & Choi 2003, McDonough, Choi & Mandler 2003). This is depicted in Figure 3.38 below.

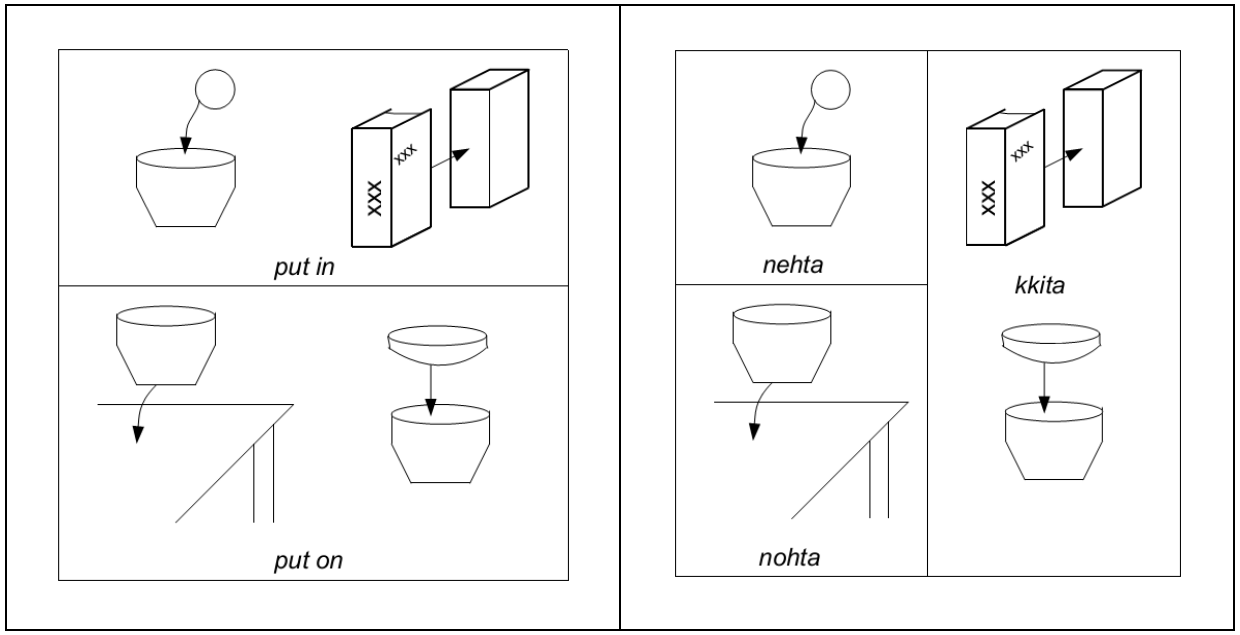


Figure 3.38: Spatial conceptualizations and their linguistic^{o} codings in English and Korean (adapted from Bowerman 1996: 152f. and McDonough, Choi & Mandler 2003: 233)

Since differentiations are what underlies features in perception, and since perception feeds into conceptualization, our conceptualizations of spatial relations and motion patterns seem similar. That means, although Korean and English people conceptualize space and motion alike (since this is simulated perception), they choose prepositions to code different aspects of

these relations which leads to conflations of differentiations: The English prepositional system (here: *in* and *on*) conflates the differentiation between TIGHT FIT and LOOSE FIT, the Korean one (here: *nehta*, *nohta*, and *kkita*) conflates the differentiation between CONTAINMENT and SUPPORT, when things fit loosely. This may very well lead to different actions when instructed. And such coding conventions seem to feed back to identification/categorization: Speakers of both languages are able to identify each of the four differentiations but tend to identify only those coded by their respective prepositional systems. As McDonough, Choi & Mandler (2003: 241) suggest, "the most salient construal of a scene is influenced by the way it is most commonly described in language."

Most importantly, this means that in principle one language has the expressive means to code the differentiations of the other but that the expressive means do not have the same status:[140]

For instance, prepositional systems are highly grammaticalized and prepositions constitute a closed class. Alternative strategies for expressing similar circumstances would have to rely on lexical and open class material. There is psycholinguistic evidence that closed-class elements are more easily accessed and processed (cf. Friederici 1985, Rayner et al. 1989). From a learning perspective their use seems to be highly routinized, i.e., more than that of open-class elements. In other words, feedback mechanisms from grammatical systems to differentiation performance are not inevitable (cf. Gennari et al. 2002, Clark 2004: 474, Kemmerer 2006, Papafragou 2007, Pourcel 2009).

In order to identify the differentiations other languages make by grammatical means, more cognitive effort might be required, since in one's own language non-grammatical means might be necessary to code the same differentiations (see also Everett 2013: 105–108).

From this perspective – if one commits oneself to an interpretation of it – the famous Whorf-hypothesis (cf. Whorf 1956) could be said to be wrong in both its strong and weak reading (cf. Werlen 2005, Papafragou 2007), since the means of coding concepts in a language do not affect the concepts speakers of that language can have or actually have. On the other hand, they do feed back to the identification/categorization and action routines, which is something completely different (cf. Gennari et al. 2002). First of all the difference between what actors/cognizers/speakers actually do and what they are able to do is neglected in Whorf's principle of relativity (cf. Whorf 1956: 214, 221), and secondly, the degree to which there is a straightforward relationship between linguistic[o] expressions and concepts (i.e., what is motivated about the relationship between conceptualization and syntactic structure according to Fig. 3.33 above) is overestimated. Thirdly, I am not quite sure what Whorf and others mean by "thought".[141]

[140] Actually, this is what Bowerman and colleagues did in their papers: When describing their experimental setup they described exactly those semantic differentiations which are coded by Korean *nehta*, *nohta*, and *kkita* in English. In order to understand their own descriptions they had to conceptualize these differentiations, even if they spoke only English but not Korean.

[141] If thought is characterized as simulated speaking, as is claimed here, then postulating that one's language exerts influence on one's thought is tautological at best, if not nonsensical.

How do we know that speakers of different languages do not (significantly) differ in their spatial relation and motion pattern concepts and how they schematize them? In other words, how do we know that the presupposition of the above categories SUPPORT, CONTAINMENT, TIGHT FIT, and LOOSE FIT is adequate for both Korean and English people? The answer to this question must go beyond linguistic^{o} evidence and include other behavioral evidence, i.e., it must be shown that people make similar differentiations in non-linguistic^{o} activity. Then one can locate the break where relativity comes into play:

> If people make similar differentiations with respect to spatial relations in non-linguistic^{o} activity (among this perception), and if people make non-similar differentiations in language, then one can locate the break where relativity enters the modelling of the linking competence, namely in the step from non-symbolic activities to symbolic activities. This relativity does not imply the (complete) autonomy of the formal side of language (i.e., the symbol system, or grammar), since it still works on the substrate of diagrammatic iconicity, but avails itself different strategies in molding this iconicity.

The non-linguistic^{o} evidence mentioned above stems from behavioral data of different sources, mainly of pre-linguistic^{o} infants, children, and also adults (for overviews see Lerner, Easterbrooks & Mistry 2003, Clark 2004, Mandler 2004, Goswami ^{2}2010, Bremner & Wachs ^{2}2010 on perceptual and cognitive development). For instance, Liben and Christensen (^{2}2010) report on studies that show that pre-linguistic^{o} infants do not only differentiate between depth and shallowness, sizes, shapes, distances, and changing positions of objects relative to each other (ABOVE vs. BELOW), but they also generalize across objects (it is irrelevant what is above/below what), thus differentiating only between spatial configurations. This is clearly an instance of schematization: The infants act/behave similarly towards similar spatial relations although different objects constitute the relation. It is also reported that infants preferably employ egocentric reference frames in orientating themselves in space but that they are also able to employ allocentric reference frames from a very young age.

Depending on the relative complexity, some spatial relational concepts are acquired earlier than others, namely simple (including a dyadic relation of a single figure/trajector relative to a ground/landmark) ones like ABOVE, UNDER, LEFT, RIGHT before more complex ones (involving a triadic relation, thus requiring more complex sensational and conceptual processes) like BETWEEN. Relations like CONTAINMENT in which one thing (figure/trajector) becomes – unexpectedly – occluded by another one, namely the container (ground/landmark), are acquired – i.e., differentiated – earlier than salient relations like SUPPORT (figure/trajector loosely located on ground/landmark) or PROXIMITY (figure/trajector next to ground/landmark) in which nothing salient happens (cf. Casasola 2008). Crucially, before children can schematize some relation like UNDER behaviorally, they must be able to recognize specific instances in which they do not yet prescind from the familiar objects involved but in which they rely on these objects. As Casasola and Cohen (2002: 261) put it, "infants first learn to recognize the spatial relationships between specific objects before they learn to generalize the relationship to novel objects." With about 14 months, children schematize the relations themselves, i.e., differentiate between, for instance, SUPPORT and CONTAINMENT, irrespective of whether their target language employs grammatical means for expressing these relations.

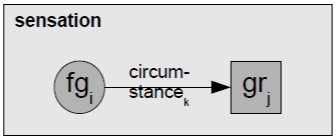
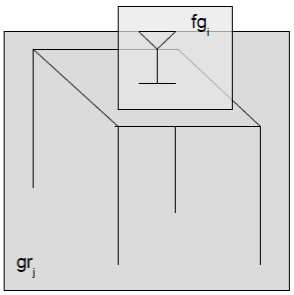
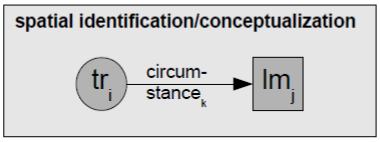
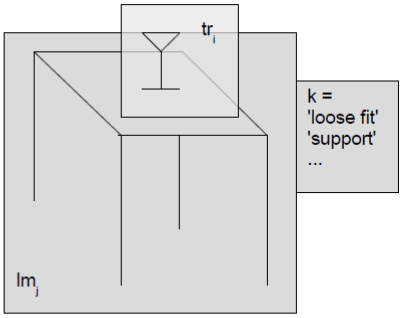
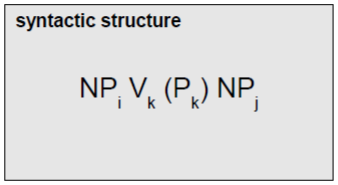
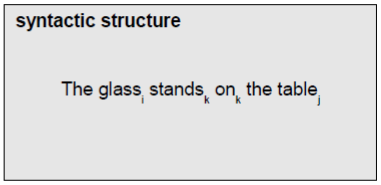
(cf. Casasola & Cohen 2002, Casasola, Cohen & Chiarello 2003, but see Choi 2006). (A non-existent differentiation between, for instance, SUPPORT and TIGHT FIT relations is given, when children differentiate between the objects involved in these relations, whereas they treat the relations in which these objects stand alike.) With respect to adults speaking unrelated languages, Malt et al. (2008) showed that differentiations between types of containers differed considerably in dependence on the spoken language when they were based on linguistic^{o} performance (naming on the basis of perception), but did not significantly differ when based on non-linguistic^{o} performance (sorting on the basis of perception), leading to the conclusion that, while people name things differently, they perceive them similarly.
Generalizing over the findings, it seems that people can schematize objects, locations, situations, events, relations etc. to a large extent independently of and prior to language in that they treat their instances alike behaviorally in dependence on salience and pertinence. That is exactly the point: Identification/categorization performances hardly ever occur in circumstances where actors/cognizers do not pursue any purposes. If one's purposes force a speaker of English to differentiate between "tight fit" and "loose fit" spatial relations because this difference becomes pertinent, then he/she will be able to do so. If he/she has no reason to do so (because of the lack of a corresponding purpose and pertinence), he/she will not make the differentiation, if it does not correspond to his/her routine which may be linguistically^{o} rooted (English closed-class prepositional system). In many experiments (e.g., McDonough, Choi & Mandler 2003) English probands are actually not given reason to deviate from their linguistically^{o} induced differentiation routines, since they are not given a corresponding purpose in the lab situation;[142] thus, they show language-congruent differentiation behavior – it simply constitutes the least cognitive effort.
In the acquisition of spatial schemas it is mainly on the basis of salience that differentiations are made and schematizations develop, since the notion of pertinence is closely related to action competence and action planning which are acquired later (see section 3.2.2). That means

- people's treating instances of some object category alike across all the circumstances in which they occur allows us as linguists to talk about these schematizations as "figures"/ "trajectors";
- people's treating instances of the location category alike across all the circumstances in which they occur allows us as linguists to talk about these schematizations as "grounds"/"landmarks" when objects are singled out against them;
- people's treating instances of simple and complex, stative and processual spatial relation categories alike across all occurrences allows linguists to talk about these schematizations as "spatial schemas".

Thus, figure/trajector, ground/landmark, and the manifold spatial relation schemas (for an attempted listing cf. Mandler 2010) in which they occur are themselves schematizations. The spatial relations depicted in section 3.3.2 are thus not depictions of the concrete relations

[142] In fact, they admit (McDonough, Choi & Mandler 2003: 235) that "adults understand the differences between containment and support as well as between tight and loose, but it was not clear to us that they would focus on the spatial relations in a task that uses many highly varied objects and that has no explicit instructions."

expressed in the corresponding sentences (3.1) to (3.13) but only the underlying motivated schemas syntactic structures elaborate. Languages make differentiations by grammatical means using closed-class elements. These differentiations have mostly already been acquired by language learners and subsume only a subset of the circumstances people are actually able to conceptualize and to verbalize (by lexical means, employing open-class elements (for further neurological and psycholinguistic evidence cf. Kemmerer 2006, Kemmerer & Tranel 2000. The latter argue that there is a double dissociation in differentiation performance with respect to conceptual spatial cognition and spatial language). The following Table 3.7 summarizes the findings of the previous sections and will be commented on in turn.

properties of speakers and languages	universality	universal aspect	specific implementation
sensational abilities and behavior	universal		 what is universally recognized
conceptual abilities (differentiation)	universal		 what can in principal be identified/ conceptualized universally
diagrammatic iconicity betw. trajector, landmark, state/relation and parts of speech	universal		 what is universally mapped from spatial conceptualization to syntax

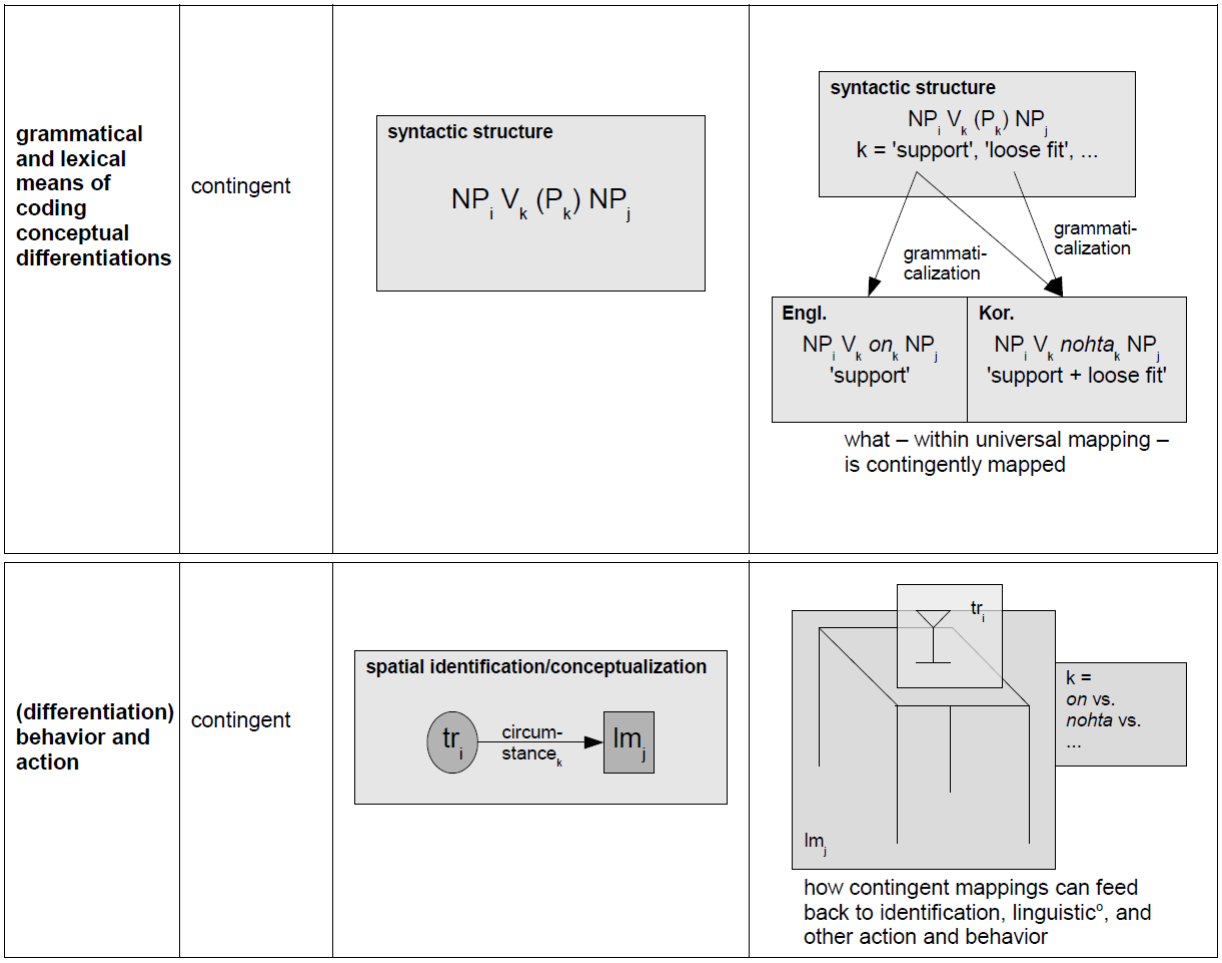


Table 3.7: Universal and contingent aspects of the spatial conceptualization-syntax relationship

The leftmost column contains properties of speakers and languages the status of which regarding their universality – whether they are universal or contingent – is given in the second column. The third one depicts the universal aspect and the fourth column depicts universal or contingent implementations of the universal and contingent aspects, respectively.

The topmost panel captures the fact that human sensational abilities and behavior (as described in sections 3.1) are universal. All people (irrespective of expected interindividual differences and pathological cases) are able to sense the same range of objects and their circumstances. Sensation is an instance of human activity and depends on the physical and biotic makeup of the sensing person. That means the fundamental principle of figure/ground segregation in sensation should be universal as well as the ability and actual performance of singling out a glass (as figure) and sensing it as standing in a specific spatial relationship relative to the table (as ground).

The second panel concerns persons' conceptual abilities, i.e., the range of conceptual differentiations they are able to make. All the different aspects of the spatial relationship between the glass and the table that are actually differentiated somewhere by someone in an intersubjectively traceable and acceptable way can in principle be differentiated and thus be identified by everyone. Although only certain differentiations become externalized verbally, actually, e.g., the 'support' relation between the glass and the table in English *on*, all the other

identifiable circumstances could in principle also be identified and thus be externalized, e.g., 'loose fit' in English as *loose fit*.
What is presumably also universal is given in the third panel: the regular correspondences between the organizational mechanisms of conceptualization and syntax, namely diagrammatic mappings from the basic components of the first – trajector-landmark configurations – to the basic components of the second – parts of speech. English- and German-oriented syntactic structure should be interpreted here in this sense as an illustration of the universal aspect: as a placeholder for any possible regular mapping between these domains in any possible language. The specific implementation shows the motivated relationship between the domains as already illustrated in section 3.3.2.
Where languages differ, however, is with regard to the question of which conceptual differentiations they have developed to code by which means: grammatically or lexically, by closed-class elements or open-class elements. This is given in the fourth line and has been demonstrated by means of the English and Korean prepositions, illustrating how there can be apparent arbitrariness within the motivated relationship between conceptualization and syntax. There is diagrammatic iconicity anyway, but it is molded in a hardly predictable way.
The fifth and last line concerns what some would call Whorfian effects, i.e., the feedback of conventions of linguistic^{o} coding into differentiation activities, i.e., externalized differentiations, either linguistic^{o} or other. This is where linguistic^{o} relativists usually cite evidence that, for instance, people whose languages employ only absolute reference frames will orient themselves in their environments in terms of non-linguistic^{o} differentiations that make use of exactly these reference frames and hardly of others, if at all (on reference frames see Levinson 1996). From the way sensation, perception, conceptualization, and action have been characterized here it should be clear that these cases concern only the actual differentiation performances of these people, not those they are able to perform and to which they could be led to perform, given the appropriate tasks (see also Landau, Dessalegn & Goldberg 2009 on this topic).

3.3.5 Manner and path in relational expressions

With respect to the question of how languages code matters of space, two often discussed notions deserve special attention: manner and path (cf. Talmy 1985, 2000; Levin & Rappaport Hovav 2005, Slobin 2000, 2005, Bohnemeyer et al. 2007, Pedersen 2008, Beavers, Levin & Tham 2010, Croft et al. 2010, Croft 2012 from linguistic perspectives; cf. Johnson 1987, Mandler 2004, 2010 from cognitive psychological perspectives). In the spatial schematizations in section 3.3.2 (Fig. 3.20 to 3.32), relations are schematized only as "motion"/"movement" or "state" (i.e., location), symbolized by straight arrows and lines, respectively. Obviously, the motion/movement relations are not differentiated there with respect to what kind of motion/movement is given, i.e., how someone or something moves, and whether the path of motion/movement is telic or atelic. For instance, in (3.1) *The ball rolls into the room* the manner of motion is "by rolling" and the event is telic, i.e., the path reaches its inherent "telos" when the ball is in the room. In (3.3) *The sun is going down* the manner of motion seems to be zero, i.e., although motion is impossible without some manner, the perceived/conceptualized motion downward in a straight line is something like the default

case, maybe because it constitutes the easiest possible conceptualization of motion. In contrast, there is no conceivable default path, except a straight one, but not with respect to direction. Any deviation from straight, uniform manner of motion/movement would thus count as salient (it defies expectation) or pertinent (for some reason or other, the way in which something/someone moves becomes pertinent). The path designated in *The sun is going down* has no endpoint because it consists only of the continuous motion downward. In *The sun is sinking*, the same is true, presumably.

What is special, however, is that there is a tendency in English and German (as the languages here from which most examples stem) that they code manner in the main verb (*roll*, (literal) *go*, *give*, *pour*, *fallen* 'fall', *fahren* 'drive', etc.), while they code (a)telic path outside the main verb (or its root stem), whereas in Romance languages like Spanish there is a tendency to code (a)telic path in the main verb and make manner the "satellite" (cf. Talmy 2000), as in *La botella entró flotando a la cueva* (lit. 'The bottle entered (into) the cave floating'. Other languages have developed additional preferences or exclusive strategies including coordinated, serial, or compounded verbs (cf. Croft et al. 2010).

The question here is that concerning motivation, i.e., the one concerning the relationship between syntactic structure and conceptualization. Obviously, many languages tend to "source out" either path or manner information from the verb stem, but nearly universally at least one of both. Why should this be the case? Why should manner information (like in Engl. *humble*) and path information (like in Engl. *enter*) in a verb stem exclude each other instead of allowing the type **henter*? This question is puzzling and at the same time hardly explored empirically (cf. Huang & Tanangkingsing 2005). I would like to propose the following treatment: Manner and path (direction) are aspects of each and every instance of motion/movement (see the sections on perception). But it is difficult to conceptualize simultaneously someone moving somewhere and thereby "employing" some manner. Foveal seeing is presumably possible only when the observer focuses on either the manner in which something is executed or on the direction to which it aims. Similarly, it is possible that in conceptualization the simulated eye gaze of the conceptualizer cannot simultaneously focus on or attend to both manner and path aspects of one motion or movement, whereas it is possible to focus on either motion/movement and manner or motion/movement and path. In the former case one attends to, i.e., focuses on the parts of the moving object that constitute the manner, e.g., moving legs relative to a stationary torso, without simultaneously focussing the object as a whole moving relative to a landmark – which would constitute a shift in trajector-landmark configuration. In the latter case one attends to the change of position of the whole moving object relative to some landmark without focussing on the part of the object which constitutes the manner of motion/movement.

In any case, conceptualizers have to sequentially conceptualize one aspect of motion/movement before the other. In this sense the "outsourcing" of one of the manner and path aspects is diagrammatically iconic with respect to the course of conceptualization and conforms to the idea of linguistic^{o} utterances as instructions for simulating perceptions. (It is, however, not iconic with respect to the course of an event and therefore not diagrammatically iconic with respect to the course of events, since manner and path are aspects of the same process/activity).

If this is true, then one question remains: Why does exploitation not concern relational expressions to a similar degree to which it concerns nominal expressions in syntactic complement positions? Regarding these, exploitation means that languages can pretend that circumstances are objects, i.e., unique concepts, i.e., trajectors or landmarks, in that these languages allow circumstances to occupy syntactic positions that, from the perspective of motivation, are reserved for objects. In this respect spatial relations as designated in language are unsuspicous *per se*, since they actually designate simple, unique states and relations. Candidates for exploited relational expressions are rather to be found in other verb classes, e.g., those containing verbs with highly social meanings like *lie*, *betray*, *promise*, etc. which only pretend to be instructions for simulating unique perceptual experiences. Sentences (3.8) and (3.9) above, which contain the verb *ähneln* 'resemble' are also examples of exploitation because resemblance is not an originally spatial relation. Here, the language learner cannot trace back the meanings of these verbs to spatial configurations by "obeying the instructions" but he/she must use these expressions as prompts to evaluate their meanings in sociocultural praxis. For that he/she must have acquired their appropriate use in constellations of joint attention within the same sociocultural praxis (see section 3.3.7 for details).

A further aspect of why manner and path are syntactically separated might be of economic nature and concern memory and learnabiliy. The set of objects that can move in specific manners and the set of objects that can move along specific paths (and to specific destinations) is not identical, due to object affordances: A paper plane can probably move (or be moved) along most or even all conceptualizable paths, but it cannot do this in any conceptualizable manner. It does not afford hobbling, crawling, and other activities that only objects with arms and legs afford. Most objects strongly afford only very few manners of motion/movement. So because of the object affordances involved, Spanish *El aeroplano entró a la cueva* 'The plane enters the cave' suggests that it does so *volando* 'flying' unless specified otherwise by a satellite phrase. The same verb can be used in *El chico entró a la cueva*, even though the manner is less clear because the boy affords many kinds of movement that are possible here, among them crawling, walking, or swimming. That means if each manner was conflated with each path in unique stems of verbs of motion, then the number of verbs would grow immensely. Splitting manner and path expressions allows only using one of them, usually path, leaving manner to inference (which is often easy because of affordances). But why should there be languages, then, expressing manner in verb stems by default, when manner often seems to violate the maxims of relevance and quantity, i.e., is irrelevant or known. I would purport that these languages as well have developed highly frequent verbs of motion/movement which in certain contexts actually do not express manner information but only motion/movement schematically. In German *Ich gehe ins Kino* 'I go to the cinema' or English *Peter went to school, go* does not necessarily mean that my movement to the cinema and Peter's movement to school happened by two-legged locomotion. It is very well possible that we "went" by bus, bike, or by other means.

3.3.6 Fixing reference in acquisition

Because this work is about an important aspect of the linking competence, namely the competence to encode and decode concepts of states, processes, and activities by means of verb-complement structures in an appropriate manner, the topic of acquisition must briefly be mentioned here. In the sections on actional notions it has already been sketched how the corresponding attributional competence is supposed to be acquired (see sections 3.2.2).

Things are different in the acquisition of spatial relation coding. Actional knowledge has been shown to be imposed on concepts that are grounded in (mainly visual) perception. It is *stricto sensu* not conceptual content, since it is not grounded in perception but "closes" otherwise underspecified percepts and conceptualizations. That means because actional notions are not of a "perceptual" kind, their coding cannot be acquired in the same manner as spatial relations. One crucial mechanism which aids the acquisition of the latter is "joint attention" (cf. Bruner 1975, Scaife & Bruner 1975, Tomasello 2003, Tomasello 2008). A situation in which a learner learns how something he/she senses is linguistically^{o} coded consists of him/her, some competent speaker, some circumstance both participants can monitor, and an utterance by which the speaker refers to that circumstance. It is necessary that both learner and speaker know that the other is visually attending to the same state, process, or activity that is taking place and that what is taking place is in their joint attentional focus in terms of eye fixation on the involved objects. This constitutes something like a triangulation (term borrowed from Davidson 1982) and helps the learner fix reference. This is schematically depicted in Figure 3.39. To be sure of what it is that the speaking person is actually referring to in an utterance, the learner uses several non-linguistic^{o} cues, among them the looking direction of the person, body posture, and speaking direction (cf. Baldwin 1991).

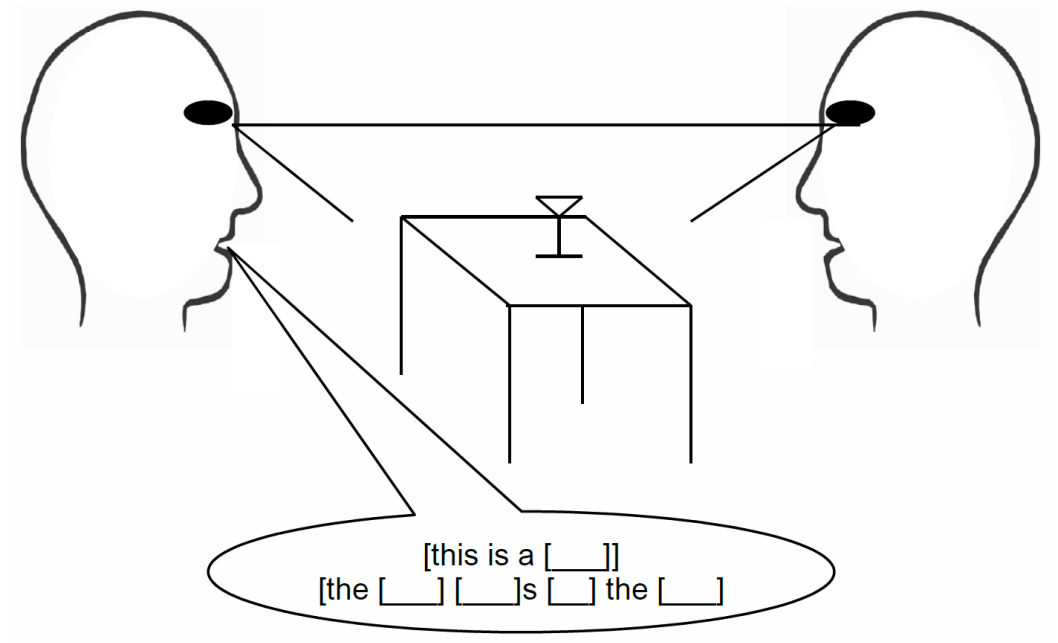


Figure 3.39: Joint attention

Another ingredient is the learner's making use of distinctive oppositions (cf. Croft 2001, Tomasello 2003: 169ff.). For example, if the speaking person says *This is a glass* in the depicted situation, the learner does not know whether the person refers to the glass, the table,

parts of the glass or the table, or to features of the glass or the table (cf. Wittgenstein [4]1980: 256). Reference is thus (allegedly) indeterminate. But if, at another occasion, the speaking person says again *This is a glass* when the glass is standing on the cupboard, the learner can infer that *glass* was not referring to the table last time. Saying *This is a table* in the absence of a glass in the (joint) visual field reinforces this inference. The novel and unexpected variable in an already familiar construction has always something salient about it and grabs attention. With sufficient repetition, this creates a slot in the utterance *This is a* /__*X*__/ in which the learner can put and expect expressions for things in perception. Other types of utterances that consist of other parts of speech work in a similar way, like *The glass/mouse/Peter stands/lies/sleeps on/under/between the table/sofa/car and the tree* (cf. Tomasello 2003).

When the child has learned that the function of some objects having similar perceptual features is that of drinking-out-of-them, irrespective of minor differences in size, shape, or color, and when it experiences that it is always called *glass*, then it is unlikely that the child will infer that it is the size, shape, or color that is designated by *glass*. Additionally to their joint visual attention, when it is clear to both mother and child in a situation that they both have the same purpose of preparing the child something to drink, and when the child knows that the diaphanous, container-like thing on the table affords drinking out of it, then it will presumably infer that in the mother's utterance *I'll give you some water. This is your glass, isn't it?*, *glass* refers to the whole object, not just some feature of it (see also Markman 1990, Gentner & Boroditsky 2001). The child need only have had former experiences in which the diaphanous, container-like thing was called *glass*. What disambiguates the indeterminacy of reference here is firstly making use of distinctive oppositions, and secondly what Tomasello (2003, 2008) calls "common ground" ("frame" in Ninio & Bruner 1978). This includes the ability to synchronize visual attention and actual purposes with one another and it fixes to a certain degree what is pertinent to putting this purpose into effect (cf. section 3.2.1.1): For the situation described above, it cannot plausibly be the color, shape, or size of the thing which is designated by *glass*. Thus, what is not depicted in Figure 3.39 is that there is a "common ground" for both speaker and learner without which joint visual attention is only an insufficient mechanism in acquisition. These indispensable competences that aid language acquisition, especially that of sharing, or synchronizing, purposes, leads us straight back to the participation in sociocultural praxis and the corresponding cognitive competences as a precondition for language, not only from an ontogentic, but also from a phylogenetic perspective.

These considerations suggest that children in constellations of joint attention learn mappings between percepts and words, mediated by identification, and thus fix reference from the very beginning. Though, this is only a later step in acquisition (for details see Tomasello 2003, Clark 2003). At least one prior step is important in the present context: "pivot schemas" (Braine 1963, 1976, Tomasello 2003). They consist of at least two words, one of which is a stable element of an utterance with which the child is already familiar. The other element is variable and maybe new. It can, as a variable, be put into the slots that are open in pivots, like *more juice* and *more car* for the pivot schema *more* [__X__]. Other candidates are *this* [__X__], *there* [__X__], *big* [__X__] or *not eat* [__X__].

From a semiotic, or reference, perspective the pivots in these examples seem to have another character than the variables: Variables designate objects in sensation or conceptualization,

pivots often do not. Bunnies, dads, glasses and Alex are things to which the corresponding child expressions *bunny*, *dad*, *glass*, *Alex* can refer, and children can learn by means of joint attention that these expressions can stand for the things. But what about *this*, *there*, *big*, or *not eat*? They do obviously not refer to objects in sensation or conceptualization but to circumstances (including locations and activities). What they stand for cannot so easily be fixed, since it is not unique percepts or concepts. Instead, these expressions stand – from a sensational and conceptual standpoint – for something more complex, namely states or situations that are parts of or which are aspects of things. Such circumstances can only be referred to linguistically^{o} because they are circumstances by virtue of the objects that constitute them. So, assuming a constellation of joint attention and common ground, it is easy to learn that if something is about thing X, one says *X*. It is less easy to learn that if the position of X relative to you is p in egocentric space, and if you want *mommy* to attend to X, then to say *there X*, because the conditions under which one uses *there* are less transparent and more complex.

That nouns are more readily acquired is – notwithstanding criticism – well documented (cf. Gentner 1982, Gentner & Boroditsky 2001; cf. Choi & Gopnik 1995 for criticism, cf. Tomasello 2003: 45ff. for reconciliation). The reason is mainly one that follows directly from the theories of sensation and conceptualization proposed here: that figures in sensation or trajectors in conceptualization are expressed as nouns. That this is the case does not rule out that children learn other expressions, too, namely when the shared purposes, saliences and pertinences make sufficiently clear under which conditions to use an "unnouny" noun (when mommy shouts *Alex, breakfast!*), a state, process, or activity expression (*Kimmy spit*; *shoe off; Kendall down*; examples taken from Braine 1976), or some "social" expression (like *hello*, *bye*, or *thanks*) (cf. Tomasello 2003: 46).

This section shall be summed up by stating that joint visual attention mainly helps fixing the reference of expressions, and this works primarily for objects of sensation and conceptualization, and that shared purposes and shared pertinences mainly help fixing the conditions of the use of expressions when joint visual attention is not informative. This works for all types of expressions, but especially when dealing with sensationally and conceptually non-basic referents.

3.3.7 Fixing reference in motivated and exploitated language use

In this section the ideas of the last section on acquisition, reference, and use shall be brought together with the ideas on motivation and exploitation in the previous sections. Figure 3.40 illustrates the now familiar functioning of motivation (a) and the two modes of exploitation discussed above (b and c).

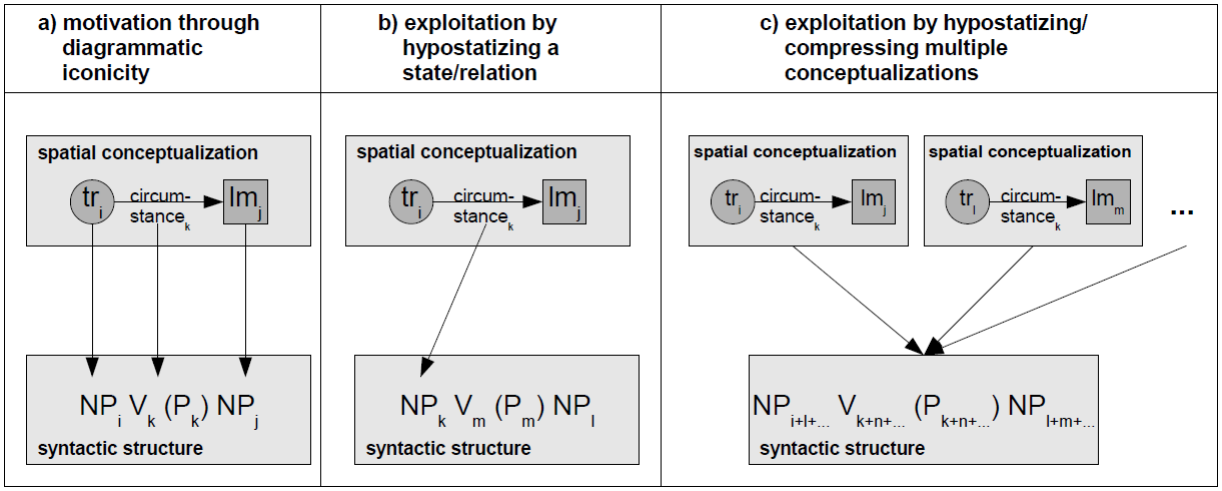


Figure 3.40: Motivation and exploitation in the relationship between spatial conceptualization and syntax

To recapitulate, exploitation by hypostatizing a circumstance (i.e., (b) in Figure 3.40) is given in the case that the regular correspondences between conceptualization and syntax (as depicted in (a), the motivated relationship) are exploited by making a conceptual circumstance the privileged syntactic complement in syntax, thereby pretending that this is a possible object of sensation/conceptualization, for instance in *Unemployment threatens the Spanish youth*.
Exploitation by hypostatizing, or compressing, multiple conceptualizations (i.e., (c) in Figure 3.40) is given, when originally multiple conceptualizations of some circumstances are coded by a single syntactic structure such that this sentence pretends to code a single and unique conceptualized state, process, or activity, for instance in *All men fall off their bikes in Marburg*.
What the acquisition of case (a) looks like, i.e., how the regular correspondences between the basic components of sensation, conceptualization, and syntax can be learned, is depicted in Figure 3.41 below.

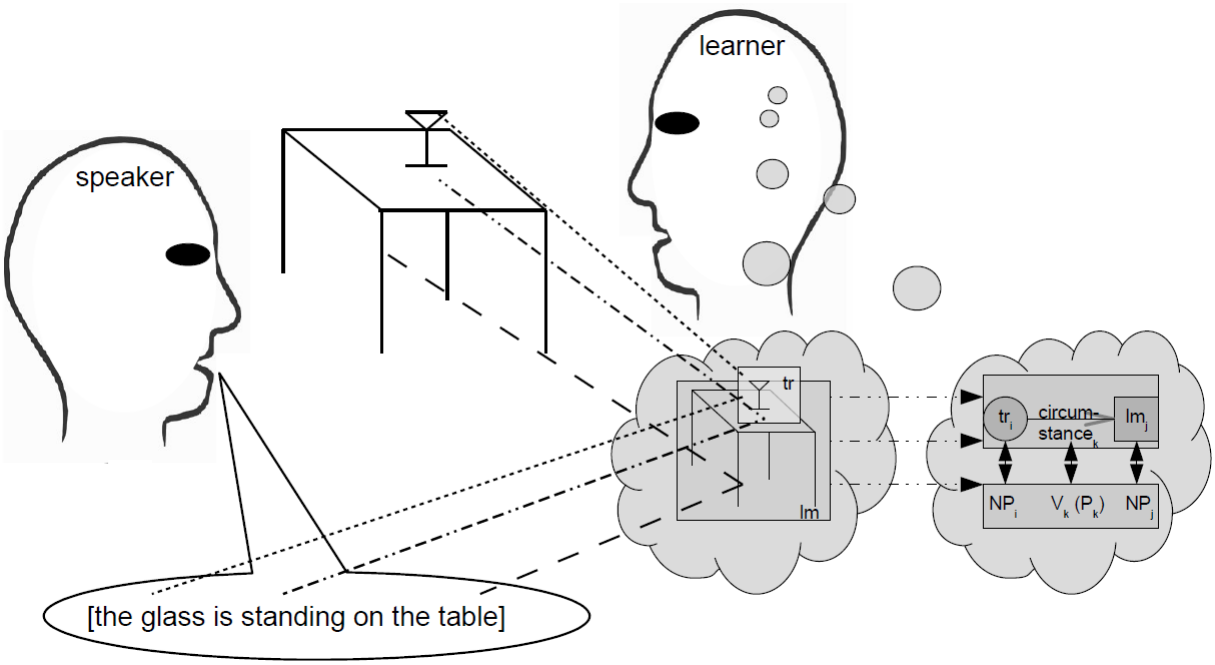


Figure 3.41: Acquisition of spatial relation coding by means of joint attention and extraction of diagrammatic iconicity

The basic arrangement is familiar from Figure 3.39, but note that the lines symbolizing joint visual attention are left out here for reasons of clarity, though joint visual attention and common ground are presupposed in this Figure. In the situation depicted here the speaker is uttering *The glass is standing on the table* and the learner hears this, while both are visually focusing on the glass. The idea is that the learner is frequently exposed to such scenarios. Assumed he/she senses in terms of figure and ground, and conceptualizes in terms of trajector and landmark, then he/she will firstly find similarities in what he/she perceives, namely that a figure relates somehow to a ground. The learner will secondly find similarities in what the speaker utters in these circumstances, namely that his/her utterance is structured in a regular manner. In terms of distinctive oppositions, the learner finds that different figures cause the first part of speech to be altered, different grounds cause the last part of speech to be altered, and that different relations between both alter the middle part. In this way the learner can recognize a regular correspondence between the parts of speech of the speaker and the figure/ground configuration in what is jointly perceived. A further step is then to identify this regular pattern irrespective of the specific things that can be identified (categorized) to be present in the visual field. That means it does not matter whether this is a glass on a table, a mouse lying under the sofa, or a tree standing beside another tree, the relationship between what the learner senses (and identifies) and what the speaker says is in any case regular. So the learner can generalize from the specific instance in which he/she senses and identifies a glass on a table to a general schema linking spatial configurations and syntactic structures. (Because "extracting schemas" means "making differentiations in doing", this can be thought of as treating the spatial configurations in question alike linguistically^{o}, i.e., coding them by means of utterances with similar underlying syntactic structures.)

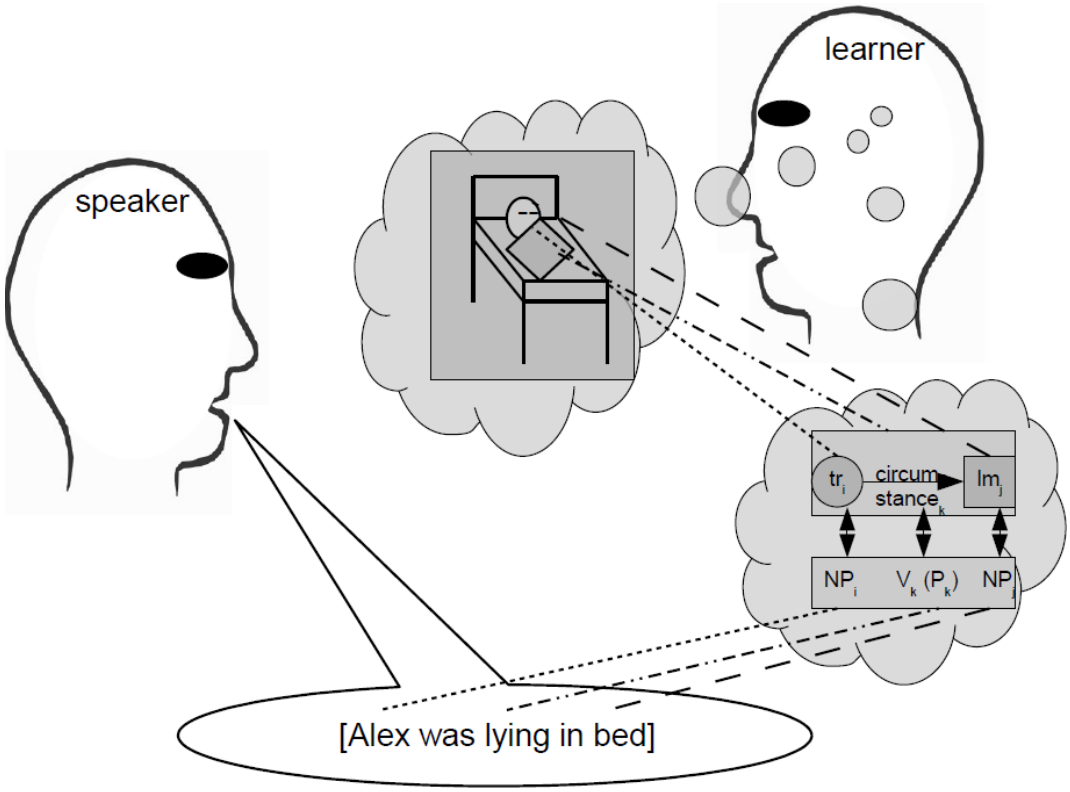


Figure 3.42: Utterance as instruction for conceptualization in the absence of stimuli and joint attention

Once the learner has gained insight into how parts of speech identified in the utterance of the speaker correspond to spatial configurations, he/she can use this knowledge to decode utterances referring to something that is not present in the joint visual field of speaker and learner. Such a case is given in Figure 3.42. The speaker utters *Alex was lying in bed* but although both persons grab each other's attention, triangulation is not possible since there are no objects in perception to which the utterance could refer. But because the learner knows which parts of speech belong to which parts of recognized or conceptualized spatial configurations, he/she is now able to "generate" a conceptualization from the utterance, precisely in accordance with the characterization of utterances as instructions for simulating visual experiences. What makes this possible is the motivated correspondence between conceptualization and syntactic structure due to diagrammatic iconicity into which the learner has gained insight: bits of conceptualization correspond to bits of utterances quite regularly.

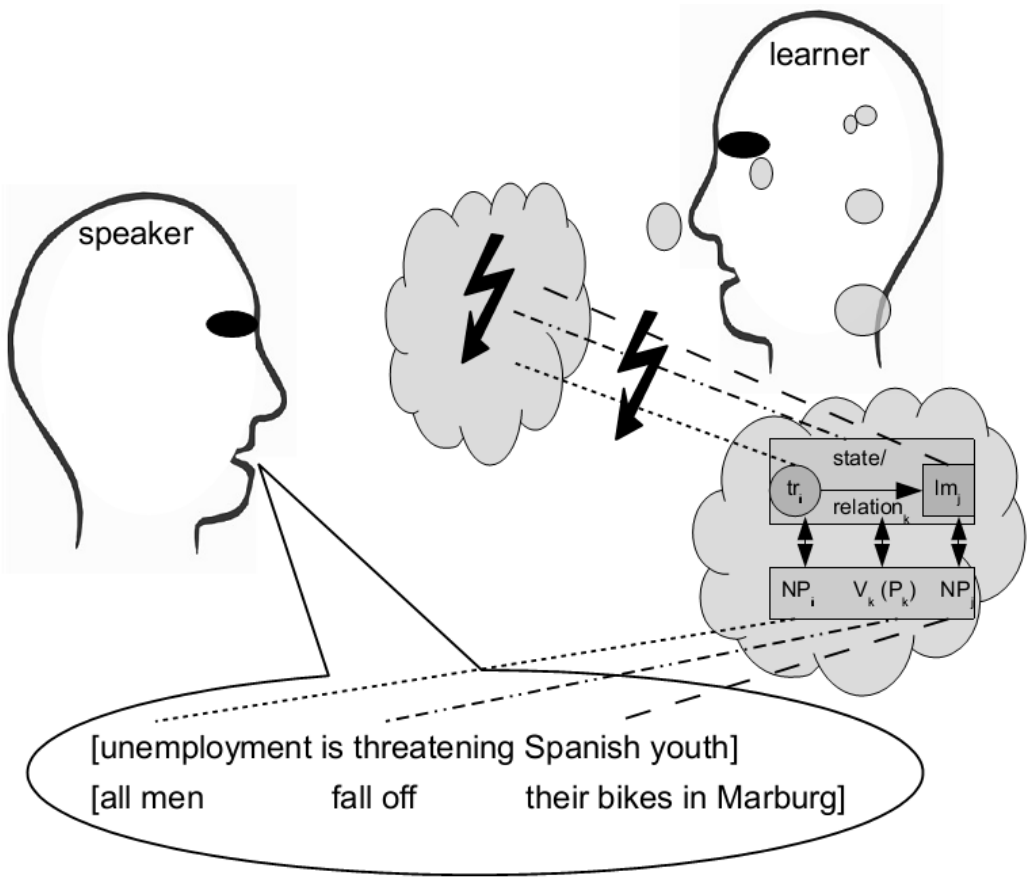


Figure 3.43: Utterance as instruction for conceptualization fails due to exploitation of diagrammatic iconicity

Now, what if the speaker utters something that exploits diagrammatic iconicity in the sense characterized in the previous sections, as in Figure 3.43? The learner will try to obey the instruction to simulate a perceptual experience just like in the case of *Alex was lying in bed*. The syntactic structure underlying the utterance *Unemployment is threatening Spanish youth* pretends to be relatable to parts of conceptualizations, i.e., to trajector, landmark, and the relation between both. It will turn out, however, that this is not possible, since neither unemployment nor the Spanish youth can serve as trajector or landmark, respectively: Unemployment is not a possible figure, Spanish youth is not a possible ground in sensation, and conceptualization is not so flexible as to make them a possible trajector or landmark, respectively. So it is not possible for the learner to generate a simulated experience from this ostensible instruction, due to hypostatization of a circumstance in accordance to case (b) in Figure 3.40. Something similar is true for *All men fall off their bikes in Marburg*, but this utterance exploits diagrammatic iconicity differently, namely by compressing multiple conceptualizations in a single construction, thus constituting case (c) in Figure 3.40.

Even if the learner cannot productively apply the linking schema he/she has acquired on the basis of motivated instances of language use, it must nevertheless be learnable: In fact, utterances like *Unemployment is threatening Spanish youth* are made, and they are accepted. But when one looks at the typical acquisition scenario (see Figure 3.39), it becomes evident that this is not available here, either: There is nothing on which joint visual attention could be directed. So how can such an utterance be understood? To give it a try, someone must firstly

know that most people have to go to work in order to earn money. Second, someone has to know that not having work means being unemployed, and that being unemployed has an effect on many people just like being physically threatened by someone or something (see section 3.3.3.1 on metaphors). Third, the Spanish youth can presumably not be made a conceptual landmark, since it lacks the necessary features. Fourth, one must be able to simulate the feeling of being threatened, must apply it to a young Spaniard, and must then be aware of the fact that for (nearly) every young Spaniard it is true that he/she is being threatened (as an instruction: Take the first young Spaniard and conceptualize him/her as threatened, take the second young Spaniard and conceptualize him/her as threatened, take the third …, etc.), when he/she conceptualizes himself as not having a job, i.e., not going to work and getting money for it.

The list could be continued, and each of these sentences I used to very roughly characterize the meaning of this sentence could again be broken down in numerous single conceptualizations exhibiting "true" conceptualizations with "true", i.e., possible, trajector-landmark configurations. What is crucial is that there is no one-to-one correspondence between parts of conceptualization and parts of speech, although the syntactic structure suggests a conceptualization that is similar in simplicity like a sentence like *Peter kicks the ball*. But if the person uttering this sentence claims validity for what he/she is saying, then he/she had to have run through numerous "true" conceptualizations which he/she has then compressed into this single sentence.[143]

If this is true, then it is expectable that the conceptualization of single words designating possible objects in perception/conceptualization (concrete nouns like *sphere*) or simple states, processes, and activities (like *blue* or *wash*) show different neuronal activation patterns than the conceptualization of single words pretending to designate possible objects or simple circumstances in perception/conceptualization (abstract words like *success*, *respect*, or *swindle*). In an experiment about the retrieval of concrete and abstract semantics, Noppeney and Price (2004) found that conceptualizing ("retrieving the meaning" in Noppeney & Prince) of abstract words in contrast to concrete ones increased activation in the left inferior frontal and middle temporal gyrus, the superior temporal sulcus, and the left anterior temporal pole. These areas have previously been shown to be involved in semantic processing at the sentence level. From these findings, Noppeney and Price (2004: 168) conclude that

> "these differential activations might reflect a particular retrieval mechanism or strategy for abstract concepts: as abstract concepts do not correspond to physical objects in the external world, subjects might generate an appropriate semantic context that fully explores and specifies their meanings."

Translated into the present theoretical account this means that in order to "fully explore" the concepts underlying some word designating perceptually/conceptually non-basic matters, it is necessary to decompress it into those basic instances of states, processes, and activities (in terms of trajector-landmark configurations) for the whole of which the use of the word would be appropriate.

[143] In *All men fall off their bikes in Marburg* there is also compression, but here multiple similar conceptualizations are compressed, since similar spatial relations underlie each instance of a man falling off his bike. Multiple different conceptualizations underlie *Unemployment threatens the Spanish youth*.

The reported differential activations could thus be argued to directly follow from the differential acquisition modes (possible vs. impossible joint visual attention on things in the environment in concrete vs. abstract language) and from the fact that hypostatized (abstract) language "processing" requires decompression into multiple trajector-landmark conceptualization sequences.

For using *Unemployment is threatening Spanish youth* appropriately there is a thus a common ground necessary between speaker and hearer that is richer than can specified here and most likely a co-text (either written, spoken, or by gesture). The hearer must decompress what this sentence designates to a degree that is determined by the purposes and pertinences of the present discourse.[144] In order not to misunderstand each other, both speaker and hearer must have sufficiently similar concepts of what the world would look like, if this sentence were a generally acceptable characterization of what is going on in Spain – they must conceptualize the practical consequences of this sentence similarly.

Thus, while the conditions on appropriate use of motivated language is learned in contexts of joint attention, joint pertinences, and joint purposes, in which triangulation between speaker, learner, and the object/circumstance talked about helps fix reference, the conditions on appropriate use of exploited language are learned in contexts of joint pertinences and joint purposes which crucially require rich additional knowledge repertoires that are not supplied by triangulation plus common ground, e.g., knowledge about languages' conventionalized metaphors, about how to decompress linguistically^{o} compressed conceptualizations, about evaluating (conceptualizing) only the practical consequences of the validity of an utterance instead of blindly obeying to the language-as-instruction objective if this is impossible.

In fact, reference is not fixed in these instances, or only fixed to the degree that the conceptualization of the practical consequences of the utterance's validity is shared by the interlocutors to a degree which does not lead to misunderstandings in the following interaction.
In the light of these considerations it would be interesting to look at hypostatizations in childrens' speech. As a prediction, it would be rather surprising if children frequently produced hypostatizations, i.e., instances of exploited language use. They can presumably not even understand utterances like *Unemployment is threatening Spanish youth*, i.e., they might not even know what to conceptualize at all.

3.3.8 Limits of hypostatization

It was noted above that hypostatization is motivated economically in that it discharges the speaker (and, if it feeds back to routines of conceptualization, the hearer) of workload. Are there limits to hypostatization? From a technical perspective, the answer is certainly "no". Hypostatization is treating circumstances linguistically^{o} as if they were possible figures/trajectors or grounds/landmarks in sensation or conceptualization, respectively. It is

[144] For instance, if the "context" is clear, this facilitates reading of hypostatized instances of written language on the sentence level, relative to when context information is not available (cf. Schwanenflugel & Shoben 1983).

thus a matter of using symbols phonetically, graphically, or gesturally to stand for some other things (in the broadest possible sense). But because symbols, let us say morphs like {high}, {un-}, {the}, {-s}, {fox}, are not identical with for what they stand, they can be arranged in any possible way without having effects on the things for which they stand, namely when they are not treated as symbols. If one combined some morphs in a fully arbitrarily way and then treated the resultant arrangement of morphs as symbols again, he/she would automatically try to use it as an instruction for conceptualization. It would be impossible for most of these arbitrary arrangements to decode them in terms of complex conceptualizations, e.g., for /*s fox the high un*/. Among the possible strings would be, given all morphs of a language, also ones like /*colorless green ideas sleep furiously*/ and this can indeed be argued to be an instance of multiple hypostatizations, i.e., exploitation. People have indeed offered interpretations for this utterance. As has become clear, this is possible by assuming that it compresses multiple conceptualizations which, when decompressed, will refer to some states, processes, or activities that are pertinent to some interlocutors in some ongoing discourse. They will be able to communicate successfully using such utterances only if a sufficient common ground and co-text is available (e.g., Everett 2013: 133–135). When asking a stranger on the street *Excuse me, do you know if colorless green ideas sleep furiously?*, this communication will not come to a happy (or at least successful) end unless a common ground is established beforehand.

That means arbitrary arrangements of symbols that incidentally correspond to some conventional patterns of how symbols are combined in a language force people to generate conceptualizations from them. But the limits of hypostatizations would be reached where misunderstandings arise, notwithstanding a common ground between interlocutors which could set the stage for the adequate decompression of what is seemingly compressed in a hypostatization.

And language, as a symbol system, provides the means to produce such hypostatizations by its infinite character (cf. Chomsky ^{2}2002). The finiteness of what is in principle possible in sensation and conceptualization, and the infinity of what is in principle possible with a linguistic^{o} symbol system are accommodated in the below Figure 3.44 which reconstructs Figure 3.37 as a semiotic triangle as it is known from Ogden & Richards (1965).

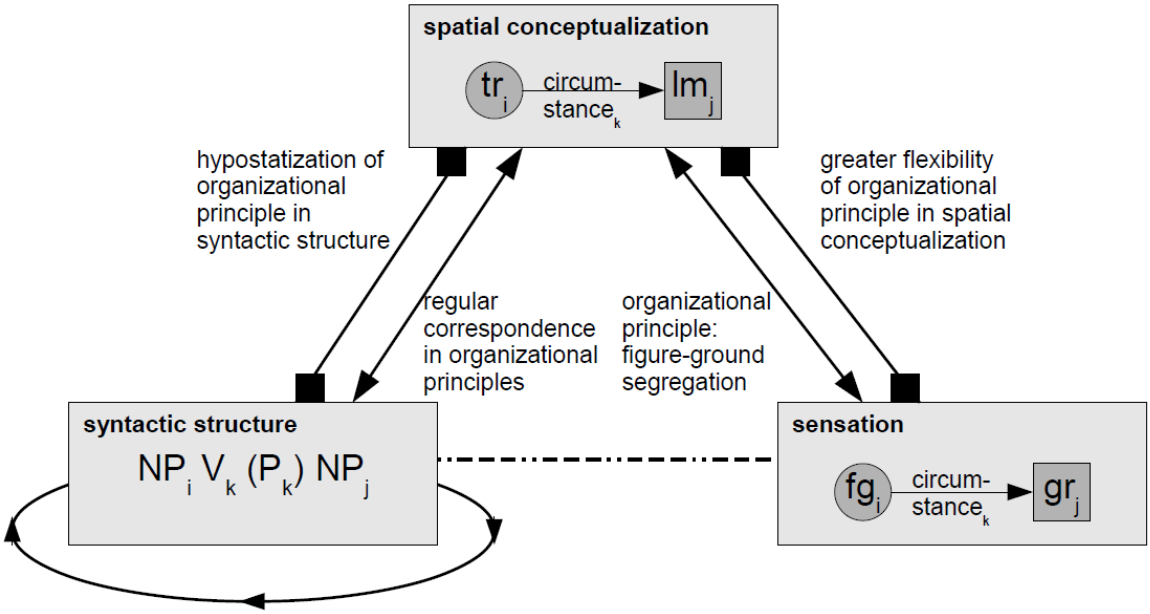


Figure 3.44: Correspondences and discrepancies in the relationship between sensation, spatial conceptualization, and syntactic structure as a semiotic triangle

The additional cycle employing arrows which is attached to the syntactic structure panel symbolizes the "idling cycle" that is built into its mode of functioning.

The idling of linguistic° signs due to the infinity of the system is what harbors the risk of decoupling combinations of signs from possible conceptualizations and what leads theoreticians to the postulation of an explanatorily self-contained syntax (cf. Chomsky [2]2002, 1965). Where hypostatizations lead to misunderstandings, precisely this decoupling has taken place.[145] In this sense syntax can be said to be partially autonomous from those actional, perceptual, and conceptual considerations which are the topic of this work.[146]

On the other hand, both sensation and conceptualization are strictly bound to the biotic makeup of our sense organs and what the environment offers to them. They are strictly definite and without idling cycles. Although a language's syntax can shape routines of making differences (categorizing) conceptually (see section 3.3.4), it cannot alter what is in principle possible in conceptualization. In this sense sensation and conceptualization are autonomous from syntax. As cognitive competences, they are complete without syntax.

3.3.9 Spatial relations and syntactic constructions

The examples for pairings of conceptual structures and syntactic structures in the previous sections have made use of only one type of spatial relation, namely trajector-relation-

[145] I think this is what Wittgenstein ([3]2001: 16) means when he says that „language goes on holiday". The German formulation is that "die Sprache feiert", meaning literally 'language celebrates' (Wittgenstein [4]1980: 260).

[146] Please note that this statement abstains from declaring whether or not syntax is partially self-contained. What is not motivated about syntax by action, perception, or conceptualization in the sense posited here may very well be motivated by other factors, or it may not.

landmark, and of only one type of syntactic structure, namely NP-V-P-NP. Concentrating now on German, it is clear that there are more syntactic structures than this one. Since we are dealing here with verb-complement structures, the following list of syntactic constructions is confined to the most important of them and not claimed to be exhaustive.

syntactic construction	**example**	**glossing**	**Engl. paraphrase**
NP_{nom}-V	(1) Philipp tanzt. (2) Die Tür öffnet sich. (3) Es schneit. (4) Tiger jagen. (5) Die Arbeitslosigkeit sinkt.	Philipp.3.NOM dance.3SG DET.3.NOM door open.3SG REFL.ACC It.3.NOM snow.3SG Tiger.3PL hunt.3PL DET.3.NOM unemployment sink.3SG	'Philipp is dancing.' 'The door opens.' 'It is snowing.' 'Tigers hunt.' 'Unemployment is decreasing.'
NP_{acc}-V	(1) Mich friert.	Me.1.ACC freeze.3SG	'I am cold.'/'I am freezing.'
NP_{nom}-V-NP_{acc}	(1) Kinder fürchten Gewitter. (2) Das Spiel dauert zwei Stunden. (3) Ich hasse dich. (4) Gewitter ängstigen Kinder. (5) Ich habe Kopfschmerzen. (6) Alex verfolgt Matthias. (7) Alex öffnet die Tür. (8) Arbeitslosigkeit bedroht die spanische Jugend. (9) Willi hat eins von deinen Gläsern runtergeworfen	Child.3PL fear.3PL thunderstorm.PL DET.3.NOM match last.3 two hour.PL I.1.NOM hate.1 you.ACC Thunderstorm.3PL frighten.3PL child.PL I.1.NOM have.1 headache.PL Alex.3.NOM follow.3 Matthias.ACC Alex.3.NOM open.3 DET.ACC door Unemployment.3.NOM threaten.3SG. DET.3.ACC Spanish youth Willi.3.NOM have.3 one.ACC of your glasses throw-down.PTCP	'Children fear thunderstorms.' 'The match lasts two hours.' 'I hate you.' 'Thunderstorms frighten children.' 'I have a headache.' 'Alex is following Matthias.' 'Alex is opening the door.' 'Unemployment is threatening Spanish youth.' 'Willi knocked over one your glasses.'
NP_{nom}-V-NP_{dat}	(1) Das Bild gefällt mir. (2) Alex vertraut seiner Mutter. (3) Alex folgt Jürgen. (4) Matthias hilft Alex. (5) Alex ähnelt Mario. (6) Mario ähnelt Alex. (7) Mario und Alex ähneln sich. (8) Willi ist eins von deinen Gläsern runtergefallen.	DET.3. NOM picture please3. me.DAT Alex.3.NOM trust.3 his.3.DAT mother Alex.3.NOM follow.3 Jürgen.DAT Matthias.3.NOM help.3 Alex.DAT Alex.3.NOM resemble.3 Mario.DAT Mario.3.NOM resemble.3 Alex.DAT [Mario and Alex].3PL.NOM resemble.3PL each other.DAT Willi.3.DAT be.3 one.NOM of your glasses down-fall.PTCP	'The picture pleases me.' 'Alex trusts his mother.' 'Alex is following Jürgen.' 'Matthias is helping Alex.' 'Alex resembles Mario.' 'Mario resembles Alex.' 'Mario and Alex resemble each other/ Themselves.' '(It happened to Willi that) one of your glasses broke.'
NP_{nom}-V-NP_{dat}-NP_{acc}	(1) Ich sende dir Blumen. (2) Horst entzieht Uta die Kinder. (3) Alex stellt Christoph Katrin vor. (4) Das Auto macht Alex nur Ärger.	I.1.NOM send.1 you.DAT flower.ACC.PL Horst.3.NOM deprive.3 Uta.DAT DET.ACC.PL child.PL Alex.3.NOM introduce.3 Christoph.DAT Katrin.ACC DET.3.NOM car make.3 Alex.DAT only trouble.ACC	'I (will) send you flowers.' 'Horst deprives Uta of the children.' 'Alex is introducing Katrin to Christoph.' 'The car is only causing Alex trouble.'
NP_{nom}-V-NP_{acc}-NP_{acc}	(1) Christoph lehrt Alex den Aufwärtshaken.	Christoph.3.NOM teach.3 Alex.DAT DET.ACC uppercut	'Christoph is teaching Alex the uppercut.'
NP_{nom}-V-PP	(1) Sie streiten vor der Kirche. (2) Vor der Kirche steht Alex rechts von Matthias. (3) Sie gehen in die Kirche. (4) Alle Männer fallen in Marburg vom Rad.	They.3PL argue.3PL in front of DET.DAT church In front of DET.DAT church stand.3 Alex.3.NOM right of Matthias.DAT They.3PL go.3PL into DET.ACC church All.ADJ man.3PL.NOM fall.3PL in Marburg off-DET.3SG.DAT bike.DAT	'They are arguing in front of the church.' 'In front of the church Alex is standing to the right of Matthias.' 'They are going into the church.' 'All men fall off their bikes in Marburg.'
NP_{nom}-NP_{acc}-PP	(1) Christoph gießt Wasser ins Glas. (2) Ich sende Blumen an dich. (3) Robert belädt den Wagen mit Heu. (4) Robert lädt Heu auf den Wagen. (5) Er öffnet die Tür mit dem Schlüssel.	Christoph.3.NOM pour.3 water.ACC into-DET.ACC glas I.1.NOM send.1 flower.ACC.PL to you.ACC Rob.3.NOM load.3 DET.ACC wagon with hay.DAT Rob.3.NOM load hay.ACC onto DET.ACC wagon He.3.NOM open.3 DET.ACC door with DET.DAT key	'Christoph is pouring water into the Glas.' 'I (will) send flowers to you.' 'Robert is loading the wagon with hay.' 'Robert is loading hay onto the wagon.' 'He is opening the door with the key.'

Table 3.8: German syntactic verb-complement constructions

In the leftmost column types of syntactic structures are listed. They are called syntactic constructions here, since they can be shown to be corresponding to simple trajector-landmark configurations, i.e., to circumstance types, quite regularly. In the second column exemplary instantiations of each syntactic construction are given. The instances of a construction vary according to several parameters, the most important of which are in the present context

whether they are motivated (*Sie stehen vor der Kirche* 'They are standing in front of the church') or exploiting instances (*Alle Männer fallen in Marburg vom Rad* 'All men fall off their bikes in Marburg'), whether they code egocentric (*Ich hasse dich* 'I hate you') or allocentric space (*Alex verfolgt Matthias* 'Alex follows Matthias'), whether they are simple or telic (*Sie gehen in die Kirche* 'They are going into the church') or atelic states, processes or activities (*Sie streiten vor der Kirche* 'They are arguing in front of the church'), and whether they code the trajector (*Ich hasse dich* 'I hate you') or the landmark (*Ich habe Kopfschmerzen* 'I have a headache') as the PSC, i.e., whether they exhibit regular or inversed mapping.

Of each construction (except the NP_{nom}-V-NP_{acc}-NP_{acc} construction) – many of which also occur in English – at least one instance has been characterized in terms of spatial relations so far in this chapter (section 3.3.2). Some constructions seem to correspond to a single type of trajector-landmark configuration, e.g., the NP_{nom}-V and the NP_{acc}-V constructions. This snarl will be unraveled in part III where the findings about actional, spatial, and temporal relations will be brought together.

The syntactic constructions in Table 3.8 were not introduced earlier because what has been said about the NP-V-P-NP construction (i.e., NP_{nom}-V-P-NP) with the exemplary instances *The ball rolls into the room* and *The glass is standing on the table* holds true for the other constructions as well: They are originally diagrammatically iconic with respect to particular trajector-landmark configurations, i.e., circumstance types, and are thus motivated; they can be and in fact are frequently exploited in that they compress multiple trajector-landmark configurations into one syntactic structure or hypostatize circumstances; the way in which they are regularly linked to conceptualizations (in terms of trajector-landmark configurations) is learned in constellations of joint attention and common ground; early exploited instances are more holistically learned in terms of conditions of use in constellations of a common ground, where common pertinences, purposes, and practical consequences concerning the utterance in question are shared.

This idea in part reflects those of Fillmore (1968, 1977, 2006) on "frames", and of Goldberg (1995: 39) on "humanly relevant scenes". Goldberg (1995: 39), building on Fillmore's work in Case Grammar and frame semantics, formulates a "scene encoding hypothesis" according to which "[c]onstructions which correspond to basic sentence types encode as their central senses event types that are basic to human experience." Constructions can be defined here in the spirit of Goldberg as form-meaning pairings at the sentential level. Examples of "humanly relevant scenes" that are "basic to experience" are, according to Goldberg, "someone causing something, someone experiencing something, something moving, something being in a state, someone possessing something, something causing a change of state or location, someone experiencing something [sic!; SK], and something having an effect on someone." (Goldberg 1995: 39). The participants in these scenes are also relevant, namely with respect to their thematic roles the set of which Goldberg largely adapts from Fillmore (1968, "deep cases") and Gruber (1970) and which includes among others agent, patient, recipient, and goal (cf. Goldberg 1995: 43). For her scene encoding hypothesis she cites evidence from language acquisition, according to which children's utterances code exactly the abovementioned basic scenes, with the participants bearing the abovementioned roles. Thereby, children employed a "set of meanings" that has "to do with agency, action, location, possession and the existence, recurrence, nonexistence, and disappeareance of objects […]." (Bowerman, cit. in Goldberg

1995: 42). Goldberg's arguments concerning the question of what makes a scene "basic to experience" draw upon other theoretical proposals, especially Langacker's archetypes and Fillmore's deep cases, and upon language acquisition data, according to which some verb meanings ("light verbs" like *do*, *go*, *make*, *put*) are learned earlier and more easily than others. Their meanings are supposed to correspond closely to the meanings of argument structure constructions (namely *do* to the simple (in)transitive construction, *go* to the intransitive motion construction, *make* to the resultative construction, and *put* to the caused motion construction).
While I agree with Goldberg on the fact that the important notions here are whole "conceptual packages" (i.e., concepts of states and potentially complex processes and activities) instead of concepts detached from any circumstances, and complex syntactic structures (coding these states, processes, and activities) instead of isolated syntactic categories, I am rather reserved with respect to three aspects in this proposal:

- What is meant by "relevant" in Goldberg's account remains unclear. This leaves open what it is exactly that makes a scene relevant.
- Notions of action and agentivity are treated along with spatial notions like location and goal.
- The basal character of "humanly relevant scenes" remains somewhat vague in that it is not quite obvious how to connect their basal character to aspects of experience, although they are supposed to be basic to experience.
- Light verbs and their meanings which correspond to the meanings of argument structure constructions need not be learned first and more easily than "heavy" verbs.

I claim these points to be reconstructable in terms of the present proposal. As to the first point, what is relevant about a scene, i.e., some circumstance, is determined by its role in action planning as being pertinent. This shall not be repeated here. Instead, be referred to sections 3.1.4.1 and 3.2.1.1 on features and action planning.
Concerning the second point, it has been argued extensively in part II so far that matters of action (as opposed to behavior) and agentivity (as opposed to "mere" causation) are grounded and acquired quite differently from spatial relations in that there is no correlate of actional notions in sensation but that concepts of spatial relations are grounded exactly in sensation. I conclude from that that these knowledge bases are not similar and that one cannot presuppose that they are similarly accessible or readily applicable in language acquisition, as Goldberg does, though building on the proposals of others. Just like in the case of hypostatized language, knowledge about actional notions is not acquired in situations of joint visual attention and triangulation, because, as has now often been mentioned, intentions, dispositions etc. are not visible. Rather, what is learned is the conditions under which to appropriately make certain attributions.
Regarding the third point, what makes a state, process, or activity (Goldberg: "scene") basic is closely related to what is pertinent (Goldberg: "relevant"). Since what can be pertinent depends on what is, or can be, differentiated by someone (see sections 2.4 and 3.1), "basic" circumstances are those that are differentiated from others on such a schematic level that each concrete state, process, or activity that is differentiated instantiates one of the few schematic

ones. In other words, light verbs prescind from coding fine-grained differences, i.e., they treat as invariant what is actually not invariant. In *Harry went to Australia* the underlying *go* can refer to walking, driving by bus, driving by car, going by ship, flying in a plane, swimming, and so on at the same time. However, one uses and understands this either because making finer differentiations is not necessary because they are not pertinent, or someone does not have the means of coding at his/her disposal ("heavier" verbs), or someone has not learned to make some differentiations, yet (he/she has not yet seen someone swimming or flying). Thus, humanly relevant scenes concern states, processes, or activities of things that are pertinent in the context of some conceptualization, and they are *stricto sensu* not basic to experience but with respect to people's identification performance, i.e., with respect to the high level of schematization they apply to them (see also section 3.4 on temporal organization).
That the high level of schematizing circumstances would be a necessity for children in acquisition can be called into question anyway: Using the example of the dative alternation in English, Campbell and Tomasello (2001) demonstrated that light verbs are actually not privileged in language acquisition. If they are used preferentially, this is due to their more frequent occurrence in the children's input. Children however very well do use "heavy" verbs. From the perspective taken here, where only spatial configurations are discussed it is irrelevant whether a verb is a light or heavy one. *Give* as a light verb and *feed* as a rather heavy verb actually code similar spatial relations at the trajector-landmark level of schematization, notwithstanding their degree of "heaviness". In this regard, and remembering joint visual attention and common ground as ingredients of the acquisition situation *par excellence*, one cannot expect light verbs to be more "basic" than others.

3.4 The grounding of temporal relations and their coding in language

- Section 3.3 has dealt with differences and commonalities in how spatial relations are sensed, conceptualized, and linguistically^{o} coded by means of regular and inversed mappings. Analogously, the present chapter deals with the question of how, or by what means, temporal relations are sensed, conceptualized, and coded, and what role actional knowledge plays in this. These general principles governing the syntax-semantics relationship are given in Figure 3.45 in the context of the research-programmatic model.

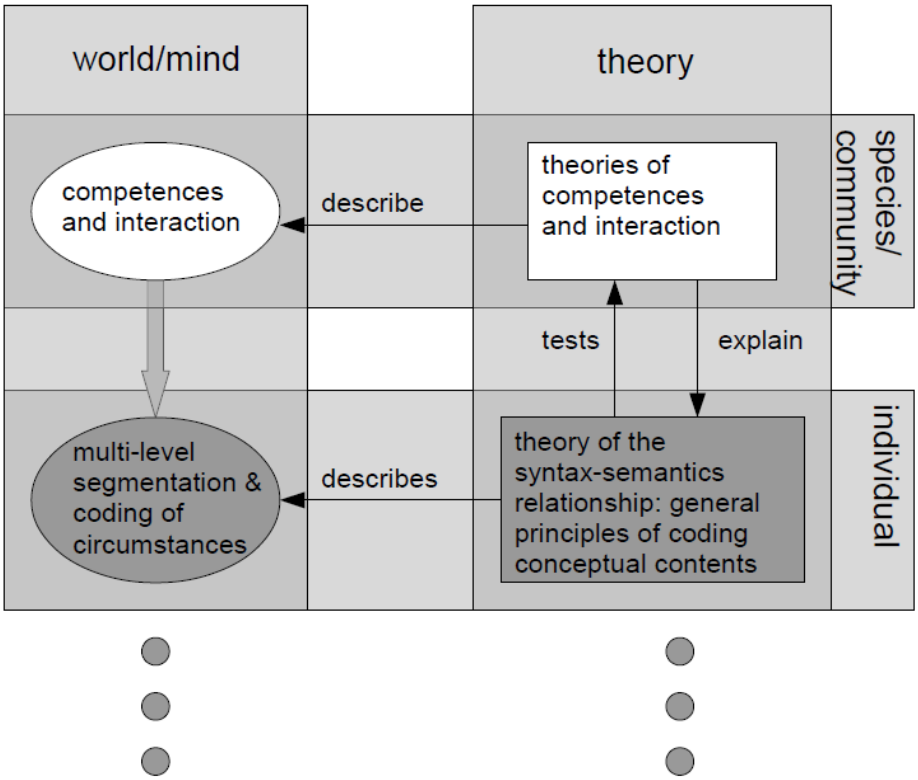


Figure 3.45: Multi-level segmentation and coding of circumstances as sub-competences of the linking competence that are developed in section 3.4

> By temporal relations I mean the temporal organization of states, processes, and activities, either simple or complex, in terms of their beginnings, ends, durations, and transitions. This organization will be shown to be closely intertwined with the actional and spatial organization of circumstances as they have been described in part II so far.

3.4.1 Temporal relations and their significance

Any circumstance of an object can be identified to be an instance of a state, a process, an activity, or a combination or repetition of these. I have already characterized these notions in section 2.4 in terms of lifeworld differentiations, as well as how they relate to situations, events, and relations. This is repeated here and will be illustrated by some examples in turn:

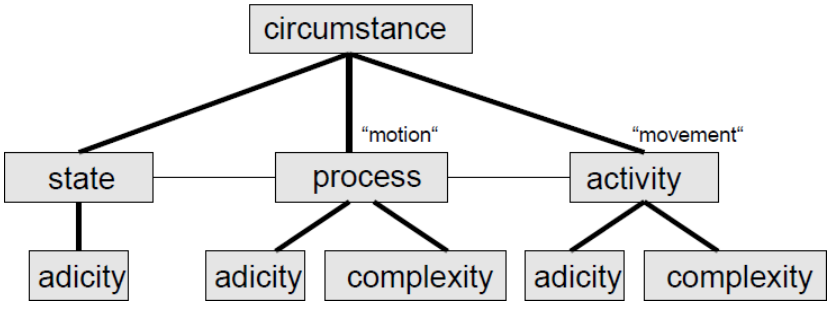


Figure 2.6: Types of circumstances and their characteristics

complexity (no. of sub-parts)			circ.-stance	adicity (no. of participant things)		
		1	state	1	2	3
3	2	1	process	1	2	3
3	2	1	activity	1	2	3

Table 2.1: Complexity and adicity of states, processes, and activities

complexity (no. of sub-parts)			circ.-stance	adicity (no. of participant things)			
		1	state	1	2	3	} "situation"

Table 2.2: Situation

complexity (no. of sub-parts)			circ.-stance	adicity (no. of participant things)			
3	2		process	1	2	3	} "event"
3	2		activity	1	2	3	

Table 2.3: Event

complexity (no. of sub-parts)			circ.-stance	adicity (no. of participant things)			
		1	state		2	3	} "relation"
3	2	1	process		2	3	
3	2	1	activity		2	3	

Table 2.4: Relation

What is important here is that by adicity those trajectors and landmarks are meant that are actually conceptualized (in order to produce a particular utterance) and those that must be conceptualized (in order to interpret an utterance), respectively. Many grounds/landmarks cannot be conceptualized as objects because they lack the respective features. They are locations, e.g., rooms, forests, countries etc. (see section 3.1.3.3). However, they are part of conceptualization, even if only portions of them are conceptualized.[147] On the other hand, complexity is measured by the number of figure/ground or trajector-landmark configurations that make up the circumstance.

I. Circumstances that can be identified/conceptualized as states are:

(3.18) Peter being sick,	complexity 1, adicity 1
(3.19) a glass standing on the table,	complexity 1, adicity 2
(3.20) Marburg lying between Giessen and Kassel,	complexity 1, adicity 3

II. Circumstances that can be identified/conceptualized as processes are:

(3.21) the water running,	complexity 1, adicity 1
(3.22) the ball rolling down from the carpet,	complexity 2, adicity 2
(3.23) the drier spinning the laundry,	complexity 1, adicity 2
(3.24) the door pushing the ball against the wall,	complexity 2, adicity 3
(3.25) the queue pushing the ball over the table into the hole,	complexity 3, adicity 4

III. Circumstances that can be identified/conceptualized as activities are

(3.26) Peter running,	complexity 1, adicity 1
(3.27) Peter rolling himself down from the carpet,	complexity 2, adicity 2
(3.28) the laundrer spinning the laundry,	complexity 1, adicity 2
(3.29) Kelly pushing the ball towards the wall,	complexity 2, adicity 3
(3.30) Kelly pushing the ball over the table into the hole,	complexity 3, adicity 4

Most linguists dealing with the temporal organization of circumstances, or what many call "event structure" (e.g., Vendler 1967, Bach 1986, Pustejovsky 1995, Rappaport Hovav & Levin 2001, Levin & Rappaport Hovav 2005, van Valin 2005, 2006), approach the topic from a naïve realistic stance. Because it is not mentioned otherwise, I have understood that states, processes, events etc. are taken to be what they are by nature, or objectively, in these proposals, i.e., independently of embodied perception, purpose-driven identification/conceptualization, and attribution. Exceptions to this are, at least in part, Engelberg 2000, the Cognitive-Functional Linguists (e.g., Langacker 2008a, Croft 2012, and

[147] The distinction between an object-ground/landmark and a location-ground/landmark is often not easy to draw. For instance, a caravan, or trailer can be an object, e.g., when a bird flies against it, such that the caravan is at the same time the ground/landmark to the bird, and an object that can be recognized/identified. If the bird flies into the caravan, its interior – where the bird is – cannot be said to be an object but rather a location. Maybe a valid criterion to tell them apart is the presence of an actualized affordance EXERT FORCE or UNDERGO FORCE: If something exerts force or undergoes force, then it is not a location-ground/landmark. The distinction between object-grounds/landmarks and location-grounds/landmarks is related to Langacker's (e.g., 2008a) setting/ participant distinction.

some neo-Whorfian studies, e.g., Bohnemeyer & Pederson 2011), and psycholinguistic studies in the ambit of CFL (e.g., the volume by Hirsh-Pasek & Michnick Golinkoff 2006).

In contrast, I take the position that the temporal organization of what verbs (together with their complements in co-composition; cf. Pustejovsky 1995) designate originates in how circumstances (states, processes, action, behavior, situations, events, relations) are sensed, identified/conceptualized, and how they undergo attribution. That means the temporal organization of circumstances is – like the actional and spatial-conceptual relations – independent of linguistic^{o} data.

Verbs, or verbs with their complements, i.e., constructions, only code circumstances whose identity is fixed in sensation, conceptualization, or attribution. How this works is discussed in the following sections. Prior to that I will briefly illustrate that linguistic^{o} data are not a reliable measure for the temporal organization of circumstances. In short, just like there is exploitation of motivated spatial conceptualization-syntactic structure mappings in the form of hypostatizations, there are instances of syntactic structures that only pretend to be coding some circumstance with *n* adicity and *n* complexity, while they actually do not. Because most of sensation, identification, and conceptualization (but not of attribution) are (due to embodiment) in a biological, psychological, neurological, or anatomical sense necessary,[148] they are more reliable sources for explaining the cognitive activities of people than are linguistic^{o} data which – as has been argued for and incorporated in the theory by means of the idling cycle of the symbol system (see section 3.3.8) – work partially independently of action, perception, and conceptualization.

3.4.2 Syntactic structures suggesting another adicity than there is conceptually

Consider sentence (3.31) first.

(3.31) *Er schläft den ganzen Tag.*
'He sleeps the whole day.'

Comparing (3.31) with a more motivated instance of the same construction like *Ich liebe dich* 'I love you' reveals that they are instances of the same NP_{nom}-V-NP_{acc} construction. But while the former only pretends to designate some dyadic circumstance, only the latter really does. A day is neither a possible object-landmark nor a location-landmark conceptually. The straightforward mapping is exploited here with respect to adicity in that the syntactic structure in (3.31) codes as dyadic what is conceptually monadic. This is visualized in the following schematics.

[148] In addition, they are to a sufficient degree accessible independently of linguistic^{o} evidence. The fact that up to this point any aspect of the linking competence has been grounded independently of linguistic^{o} evidence should be seen as the attempt to validate this claim. Another important aspect here is that identification and conceptualization are in an action-theoretic sense necessary, namely in that they are purpose-dependent, i.e., their functioning depends on what is pertinent from an action-theoretic perspective.

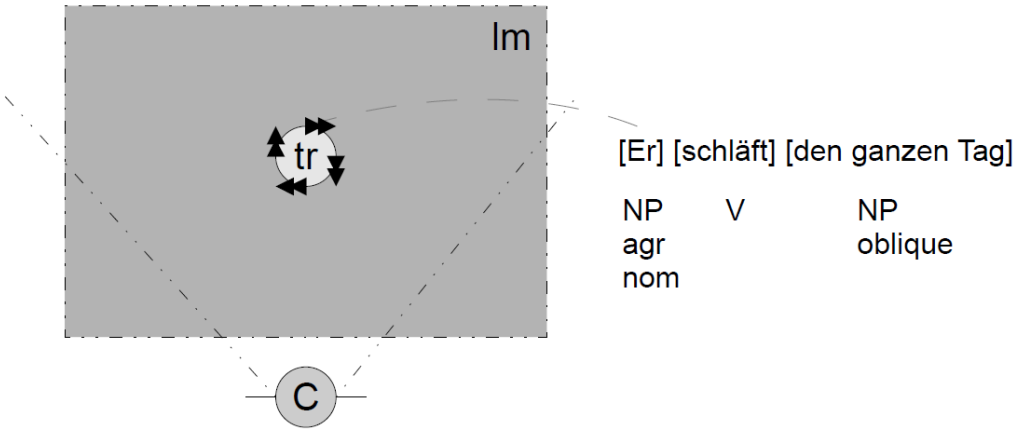


Figure 3.46: Monadic circumstance pretending dyadicity

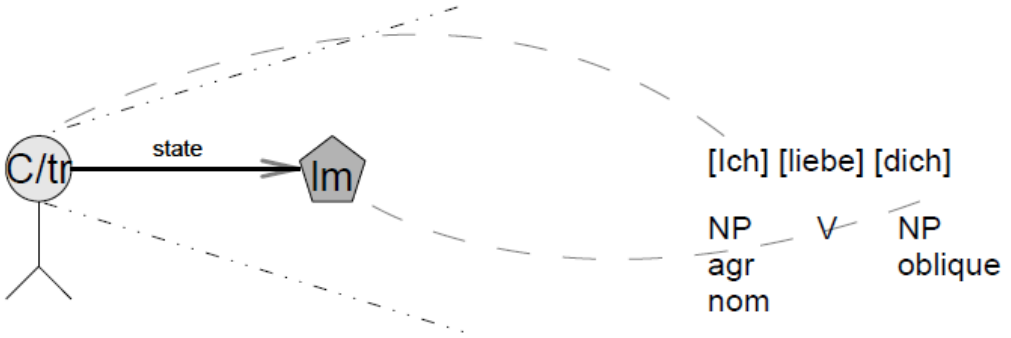


Figure 3.47: Dyadic circumstance mapped straightforwardly

In contrast, (3.32) constitutes the case in which a sentence codes as monadic what is conceptually dyadic.

(3.32) *Tiger jagen nachts.*
'Tigers hunt by night.'

Hunting is clearly an activity in which a figure/trajector stands in some spatial relation to an object-ground/landmark. (3.32) does not contain an expression for a ground/landmark. From the perspective of diagrammatic iconicity, it thus pretends to designate a monadic activity, while it is actually an instruction for a competent speaker/hearer to conceptualize a dyadic relation, as given in Figure 3.48.

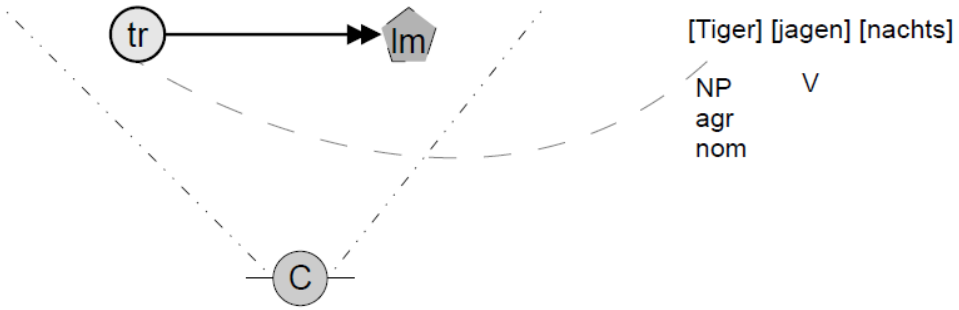


Figure 3.48: Dyadic circumstance pretending monadicity

In a similar manner (3.33) and (3.34) below suppress an object that is there in the spatial conceptualization of the designated event, respectively. In (3.33) it is the butter which is "incorporated" here in the verb (e.g., Gruber 1970, Jackendoff 1990, Pustejovsky 1995). When also conceptualizing a knife with which the buttering is executed, one could argue that a circumstance with adicity = 4, paraphrasable as "John, using a knife, smears butter on his toast" is being dealt with. In (3.34) the second sub-part of a causal relation is expressed without expressing the causing circumstance without which the caused circumstance would not have taken place.

(3.33) *John buttered his toast.*

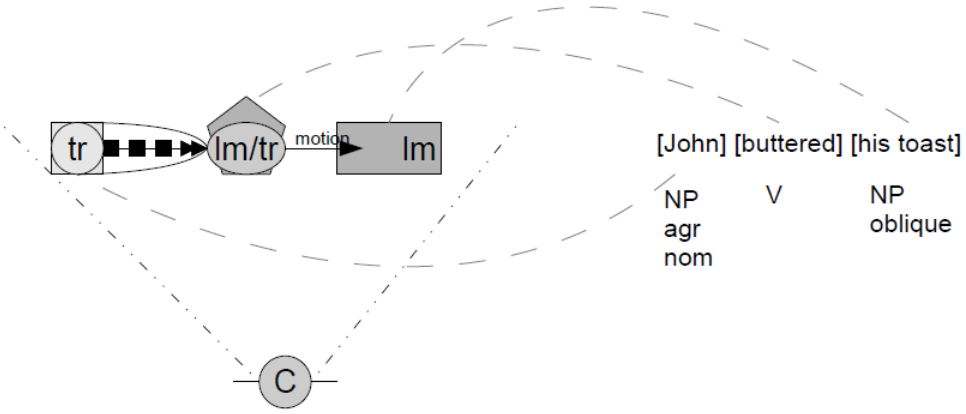


Figure 3.49: Triadic circumstance pretending dyadicity

In Figure 3.49 the trajector (John) acts with a limb (arm) towards the object landmark (butter) so that the butter moves as trajector onto the toast which is its landmark.

(3.34) *The window broke.*

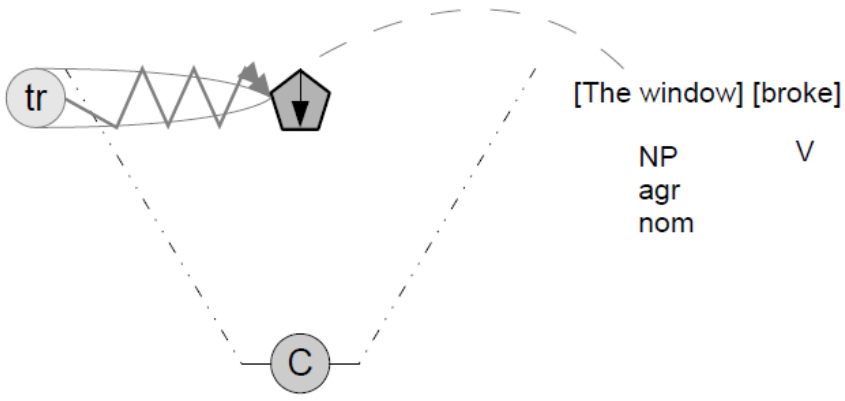


Figure 3.50: Dyadic circumstance pretending monadicity

In Figure 3.50 the causing circumstance not expressed could have been one in which exertion of force of some trajector is directed at the window by means of an activity using some limb. Traditionally, adicity is discussed in the context of the valency of a lexical, mostly verbal, item and in the context of the so-called argument/adjunct distinction (cf. Ágel et al. 2003,

2006 for an overview on valency).[149] The following sentence (3.35) will make clear why adicity is discussed in the present context.[150]

(3.35) *Alex makes coffee.*

The question discussed here is which circumstances verbs (and their complements) designate and by what features these circumstances are constituted. Because the temporal structure of circumstances is not determined by syntactic issues or linguistic^{o} facts, as has been argued, but by issues of perception, conceptualization, and action, the example of making coffee constitutes a problem with respect to adicity. To be precise, the activity of making coffee includes quite a number of objects and their relations to each other, such that a nearly exhaustive conceptualization of such an activity could easily be constituted by an adicity > 10 (cf. Cooper & Shallice 2000, 2006, Cooper & Glasspool 2001, Jackendoff 2007: 123ff.).
At first glance, (3.35) looks rather unsuspicious. Though, it starkly compresses the conceptual load of making coffee in a simple NP_{nom}-V-NP_{acc} construction, thus pretending conceptual simplicity. Now, many linguistic theories face the problem that they have to analyze (3.35) as a simple event, actually, i.e., as an event with only two sub-parts (e.g. Grimshaw 1990, Pustejovsky 1995, van Valin 2005).[151] There might be linguistic^{o} reasons for this (scope of adverbs and other formal-syntactic operations the construction can undergo), while it is conceptually and from the perspective of an action theory rather implausible. Understanding and using *Alex macht Kaffee* appropriately – i.e., being able to simulate a perceptual experience from the utterance, and/or evaluating its practical consequences by drawing from common ground and co-text in the case of hypostatization – must plausibly include going down to its spatial and actional structure; this was argued for in the setting up of the research programme (see part I). The foundations of how this works were laid down in the previous sections and they are continued here.
The task for the next section is then to outline the mechanisms by which circumstances are temporally organized in sensation, identification/conceptualization, and action/attribution. Then I will investigate whether there are regularities in how the resulting structures are related to verbs, complements, and the constructions which designate circumstances.

3.4.3 The temporal organization of circumstances in sensation

Strictly speaking, talk of "temporal conceptualization" is misleading. Conceptualization is simulated perception, and sensation, as the bottom-up part of perception, is restricted by the capacities of our sense organs. Because we lack the corresponding sense organs there is no way to sense temporal relations, and consequently no way to simulate such sensations. Because a satisfactory treatment of time, whatever it might be (cf. Mortensen 2011 for a brief overview on philosophical positions), is illusory here, I deduce the following treatment from

[149] The literature on the topic is hardly manageable. In general, most theories of syntax or grammar take a position with respect to what is "argument" and what is not by what criteria.
[150] In fact, regarding contents one could very well also have discussed the topic in the section on spatial conceptualization.
[151] Roughly, as an event consisting of an activity ("making coffee") that is followed by a state ("there being coffee").

what has been said so far: "Time" is a terminus of reflection, and a motive of thinking or speaking about temporal matters constitutes itself when actors/cognizers recognize, identify, or conceptualize the changes of objects in the sense of their motion/movement relative to some ground/landmark, in the sense of getting or losing integrity (i.e., object features), or in the sense of getting or losing one or more features without losing their integrity. This is the reason why the temporal organization of circumstances is closely intertwined with their spatial organization, as mentioned above. The temporal organization of circumstances in sensation is thus implicit in what has been said in the sections on sensation:

> Boundaries between circumstances are constituted by changes in figure/ground configurations, (a) feature(s) of (a) figure(s) or its/their integrity as recognized by a perceiver from his/her particular vantage point.

Sensing Alex making coffee is then constituted by sensing innumerable such changes. (Note also that each of these changes is an actualization of an affordance of the involved figure, and each affordance is dependent on one or more features of the figure. When a ball is rolling, this is possible because the ball affords rolling, and it does so because it is round.) To facilitate matters a bit, let us assume Alex made tea (using a teabag), not coffee. Then, "event structure" at the level of sensation consists in a number of figure or figure/ground changes.[152] This is illustrated in Figure 3.51 below in a necessarily simplified manner.

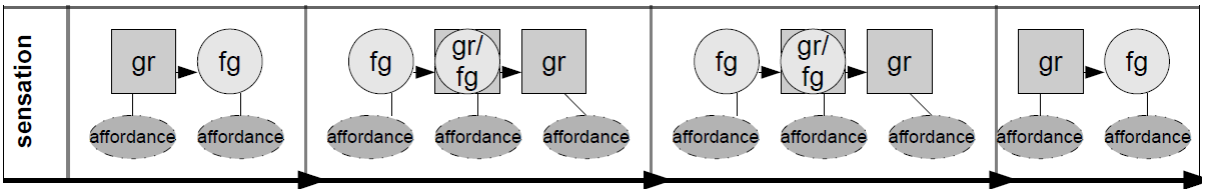


Figure 3.51: Temporal organization of circumstances in sensation (simplified)

Figure 3.51 shows a sequence of different figure/ground configurations. The arrows at the bottom symbolize elapsed time, the vertical lines separating the panels symbolize time segments. The second and third segments show that the ground of one figure/ground configuration can function as the figure of another figure/ground configuration. The idea is that in the first sub-part Alex (as ground) takes a teabag (figure), in the second he (figure) puts the teabag (first ground, then figure) into a cup (ground), in the third Alex (figure) pours water (first ground, then figure) into the cup (ground). In the final sub-part Alex (ground) takes the tea (figure). The flux of impressions is thus segmented by means of bottom-up processes in sensation.

[152] I take this to be in line with the statement of Zacks et al. (2007: 279), according to which "event segmentation depends on changes in the environment […]. Physical changes in the environment can drive event segmentation in a bottom-up fashion by increasing the potential for prediction error."

3.4.4 The temporal organization of circumstances in identification/conceptualization

Now it is possible that the circumstances from Figure 3.51, as recognized by an actor/cognizer, are identified to be instances of some processes or activities for which the actor/cognizer already has concepts. This is illustrated in Figure 3.52 below.

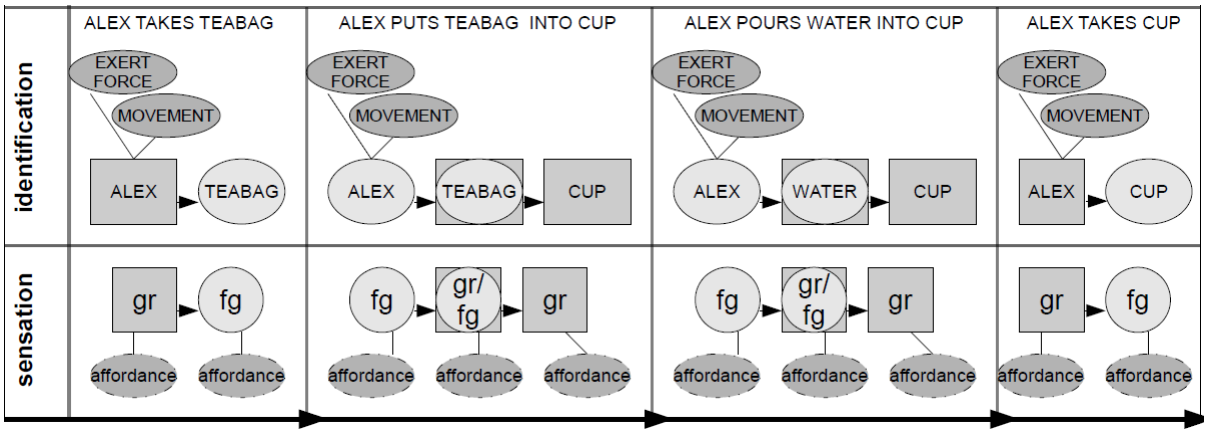


Figure 3.52: Temporal organization of circumstances in identification/conceptualization

In Figure 3.52, the figure/ground configuration of the first time segment is identified to be ALEX TAKING A TEABAG, i.e., the figure is identified to be Alex, the ground is identified to be a teabag, and the relation between both is identified to be one of reaching, grasping, and taking. (Actually, the figure/ground configuration(s) underlying the conceptualization of Alex taking a teabag could be analyzed in a more fine-grained manner, of course, but Figure 3.52 simplifies the correspondences between sensation and identification for the sake of comprehensibility). The percepts of the following time segments could likewise be identified as ALEX PUTTING THE TEABAG INTO THE CUP, ALEX POURING WATER INTO THE CUP, and ALEX TAKING THE CUP. The darker ovals symbolize actualizations of some of the affordances of the involved objects.

Now, frequent prior sensational experiences with similar types of events, knowledge about the affordances of the involved objects, accompanied by long-term potentiations resulting from similar identification performances in the past lead to schematizations (one could also say: to the development of schemas) in identification/conceptualization. Schematizing consists in invariant behavior towards varying stimuli (see sections 2.4 and 3.3.4) but it can also consist in treating as one what is actually many. One type of such schematizations consists in the knowledge about how perceived motion sequences (processes) will work out: Although putting a marble into a marble run is followed by several changes in figure (=marble)/ground (=walls/obstacles) configurations which constitute many events in sensation, our knowledge about the physical behavior of the marble (because of its features and affordances) in the marble run (because of its features and affordances, and the mutual affordances with the marble) allows us to conceptually predict how the event will work out, namely in the marble's rest at the bottom of the marble run. In sensation, what happens from the marble's entering the marble run until its resting position at the bottom is multiple events. But when identifying the entire sequence of figure/ground changes as the instance of a motion schema, then what

happens between the marble's entering the run and its rest can be said to be a single process (namely as a schema).[153]

What is of central importance here is that although identification/conceptualization can unitize by schematization what is separated in sensation, the outer boundaries of the superordinate event of the marble running through the marble run overlap in sensation and identification: The marble's entering the marble run and its coming to rest constitute changes in figure/ground configurations at the level of sensation as well as they start and conclude the motion schema as a whole at the level of identification. That means identification/conceptualization cannot "make" boundaries where there are not at the same time boundaries in sensation.

3.4.5 The temporal organization of circumstances in attribution

Obviously, what is depicted in Figure 3.52 on the sensation and identification levels is the multiple spatial relations underlying the superordinate event of Alex making tea. Knowing this is, however, not possible on the basis of the percept, and not possible on the basis of identification alone, as has been argued extensively in sections 3.1 and 3.2. The reason is that perception, i.e., the activities of sensation and identification, are underspecified with respect to action-theoretic considerations, namely intentions, reasons, and purposes. All this is specified in the context of attribution which operates on the basis of sensational and conceptual data in that it is imposed on what we recognize, identify, and conceptualize.

That means on the basis of sensation and identification/conceptualization we cannot determine that ALEX TAKING A TEABAG, ALEX PUTTING THE TEABAG INTO THE CUP, ALEX POURING WATER INTO THE CUP, and ALEX TAKING THE CUP are parts of a superordinate action schema. That ALEX MAKING TEA is indeed the action unitizing the partial activities from identification and sensation is determined not until attribution: Let us say I am, as observer of these events (=actor/observer difference) sympathetic with Alex (=sympathy/antipathy difference), and I consider making tea an accomplishment (=accomplishment/misaccomplishment difference), then the attribution theory developed in section 3.2 predicts that I judge what Alex is doing in such a way that he has reason to do so, that he does so because of stable dispositions, and that he deserves credit for what he does. The conclusion is that what he does is an instance of action and that he can be made responsible for what he is doing. The crucial point is what is implied by the fact that he is attributed a reason for his activities. This means he has a purpose, i.e., he is acting in order to put into effect a specific circumstance. The above activities (ALEX TAKING A TEABAG, ALEX PUTTING THE TEABAG INTO THE CUP, ALEX POURING WATER INTO THE CUP, and ALEX TAKING THE CUP) thus get the status of ancillary action schemas of a superordinate action schema which is a means to the end of ALEX HAVING TEA TO DRINK.

Apart from these action-theoretical considerations there is neurological evidence that these postulated top-down mechanisms in organizing circumstances from the perspective of attribution can be dissociated from the bottom-up mechanisms characterized previously. Zalla, Pradat-Diehl & Sirigu (2003), Zalla et al. 2004, and Zalla et al. 2006 have shown that

[153] This also agrees with Zacks et al. (2007: 279). According to them, "event segmentation" can also be governed by bottom-up and top-down processes in perception.

schizophrenic patients with frontal lobe damages show normal performance in low-level (i.e., sensation-based) segmentations of events but poor performance in higher-level (i.e., attribution-based) ones (see also Brunet, Safarti & Hardy-Baylé 2003).
The interrelations discussed in this section are depicted in Figure 3.53 in which the levels of sensation and identification are supplemented by that of attribution.

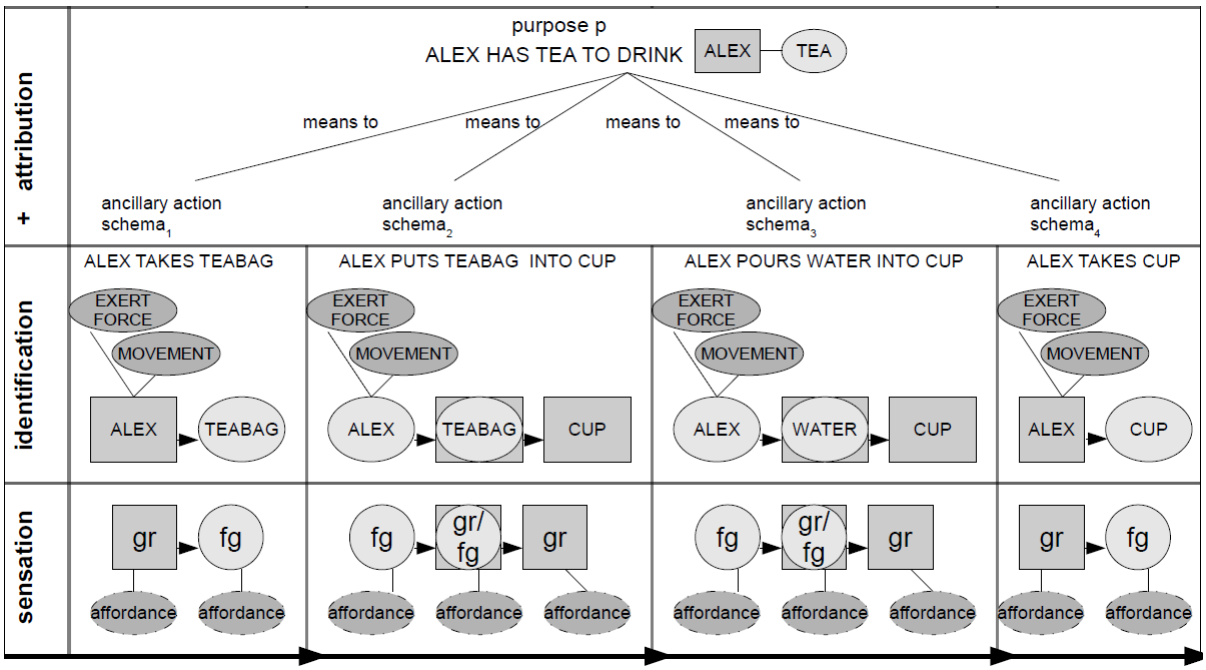


Figure 3.53: Temporal organization of circumstances in attribution

What Figure 3.53 shows is that it is solely by means of attribution that the four independent circumstances from identification can be bound together to constitute a single, superordinate action schema. In addition, it shows that attribution is imposed on the spatio-temporal relations from identification, i.e., it cannot contribute sub-parts of the circumstance by itself. In the previous section it has been argued that superordinate circumstances in identification as a result of schematizations in turn respect the boundaries of spatio-temporal relations from sensation, i.e., one cannot create boundaries of circumstances in identification which are not at the same time boundaries in sensation. This basic insight is also expressed by Zacks et al. (2007: 278). They say "[i]f viewers segmenting at a fine grain were spontaneously grouping fine-grained events into larger units, one would expect coarse-grained event boundaries to be a subset of fine-grained event boundaries." Note that the studies cited in this section (see also Baldwin et al. 2001, 2008) also provide additional evidence in favor of the thesis that actional knowledge (attribution) is imposed on otherwise underspecified spatial conceptualizations.
From all this it follows that by attribution one can unitize innumerable figure and figure/ground changes by making them parts of an action chain that serves to put into effect a superordinate purpose. Although making tea is a complex action schema already, consider what – from the perspective of the sensation and identification levels – is contained in the action schema PRIVATIZING THE SOVIET BUSINESS COMPANIES, for instance. In traditional event structure theories it consists of two sub-events at a single level which clearly does not do justice to the complex and intertwined understanding activities people enact in these cases.

To sum up, by climbing the levels from sensation over identification (and conceptualization) to attribution it is possible to unitize ever more figure and/or figure/ground changes (e.g., reaching for a teabag) into superordinate circumstances, either by schematizing processes (in identification/conceptualization, e.g., the marble run) or by attributing action chains for putting superordinate purposes into effect (e.g., making tea).

3.4.6 Coding the temporal organization of circumstances

Looking next at the verb-complement structures by which the temporal organization of circumstances are coded linguistically^{o}, it is easily observable at first sight that these constructions may designate circumstances from sensation, identification/conceptualization, as well as from (identification/conceptualization plus) attribution levels. I have tried to illustrate this by implementing yet another level ("language") into Figure 3.53. The revised version is given as Figure 3.54 below.

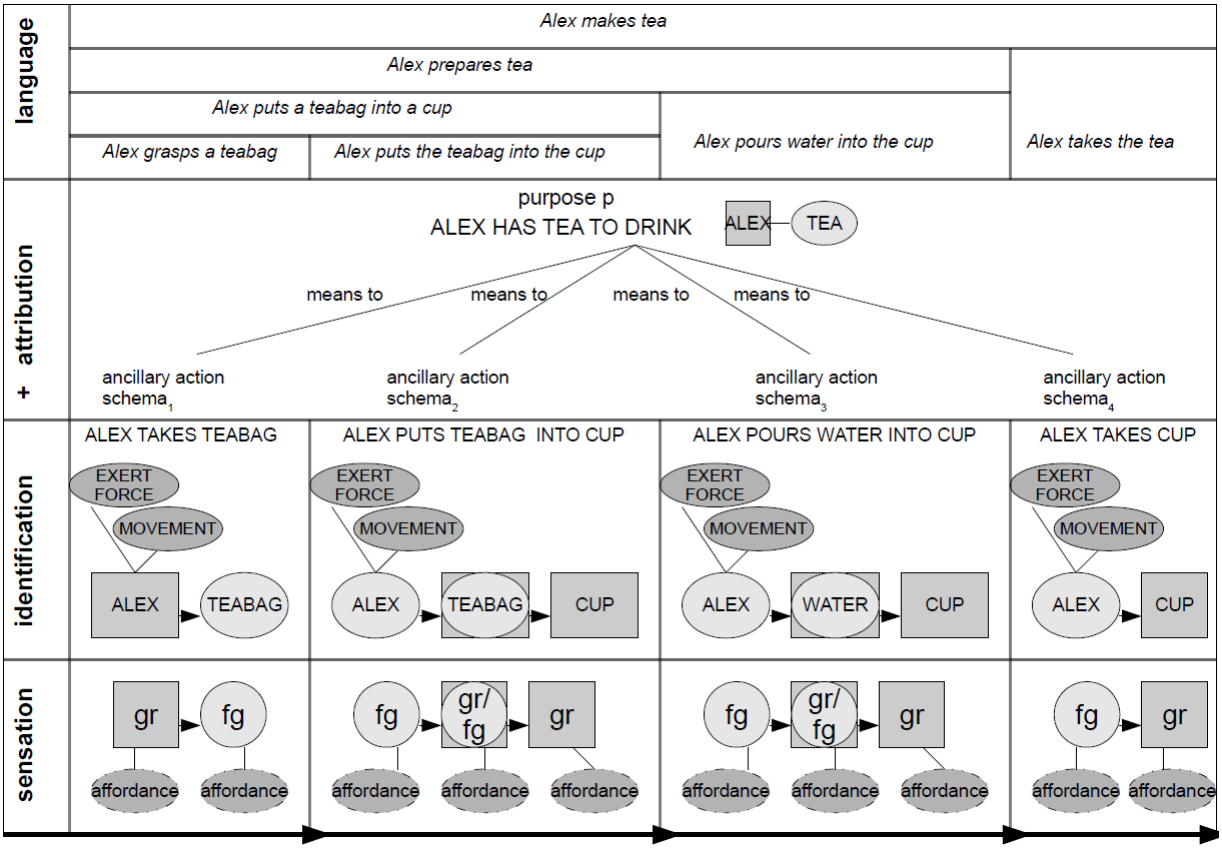


Figure 3.54: Linguistic^{o} coding of the temporal structure of circumstances

The language level illustrates that there are simple syntactic constructions for coding each of the four sub-parts of the ALEX MAKING TEA activity on the attribution level. One should not be irritated by the fact that the corresponding utterances strongly resemble the "concepts" of these sub-parts on the identification level. Remember that this notation (e.g., ALEX TAKES TEABAG) is only a convenient means for presenting concepts, i.e., simulated percepts. There are also means of expressing the first two sub-parts (*Alex puts a teabag into a cup*) or the first three parts (*Alex prepares tea*) of the superordinate activity by a simple construction

consisting of a simple verb-complement structure. More or less trivially, *Alex makes tea* codes the entire structure in that way. There might be several lexicalization patterns more besides those listed, maybe even more appropriate ones.[154]
What are the semiotic implications of that? Does *Alex takes a teabag* stand for a figure/ground configuration from sensation, and does *Alex makes tea* stand for differentiations that are made in attribution? I will propose the following: In the present and the previous sections I have tried to show that there are no boundaries in attribution that do not exist in identification/conceptualization, and that the latter do not contain boundaries that are not there in sensation.

In other words, the circumstance segmentation from sensation which functions by means of figure and figure/ground changes is preserved in the higher levels of identification/conceptualization and attribution.

That means there is no temporal structure of a circumstance in identification/conceptualization and attribution that was not first in sensation. With respect to these temporal organizations utterances code what we identify/conceptualize and – in the case of activities – attribute. Though, the differentiations that are coded originate in sensation. This is captured in Figure 3.55 below using the example sentence *Alex macht Kaffee* 'Alex makes coffee'.

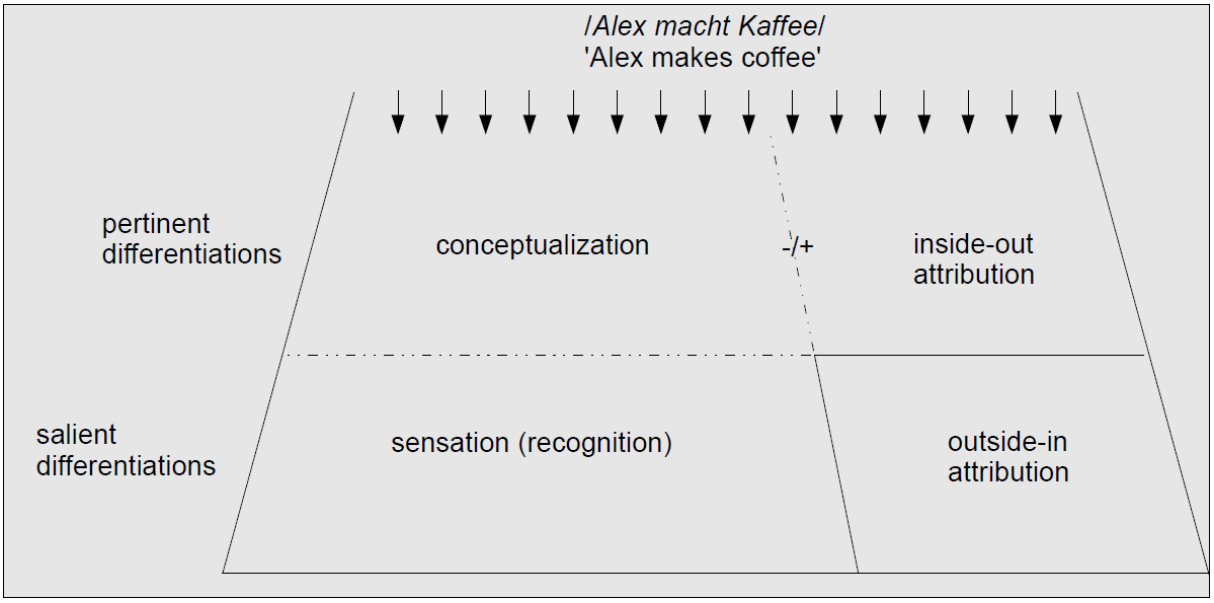


Figure 3.55: What utterances code

[154] Talmy (2000, I, 4) has developed a typology of the syntactic means by which sub-parts of circumstances are coded or not. The cognitive correlate of these grammatical and lexical mechanisms is called "windowing of attention" by Talmy. The event of a bird flying out of the window through the air and onto the roof has several sub-parts. Linguistically°, this can be coded by *The bird flew out of the window through the air onto the roof*, where all sub-parts are expressed ("windowed"), alternatively by *The bird flew out of the window onto the roof*, where one medial sub-part is gapped, by *The bird flew out of the window*, where the last two sub-parts are gapped, or by *The bird flew onto the roof*, where initial and medial sub-parts are gapped. Talmy's idea is that these windowing and gapping mechanisms are co-determining attentional processes of interpreters.

The idea expressed in Figure 3.55 and defended in this work is that linguistic^{o} utterances containing verb-complement structures externalize pertinent differentiations made in conceptualization and attribution by means of a symbol system.

Pertinent are those features in identification/conceptualization and those matters of attribution which serve putting some purpose into effect. Attribution applies wherever some animate object is involved in some circumstance. "Inside-out" in the context of attribution means that in producing or interpreting the utterance, the speaker or hearer is the attributor. If there is no animate object involved, the utterance externalizes differentiations made only in identification/conceptualization. This is symbolized by the dotted line between conceptualization and attribution. The dotted line between conceptualization and "sensation (recognition)" symbolizes that differentiations made in sensation are preserved in conceptualization, but that linguistic^{o} utterances externalize only the latter, not the former (That is also why it is possible to talk about things not present, i.e., which are not sensed). Differentiations made in sensation may be due to salience, i.e., perceivers are forced to identify, for instance, two processes because some figure/ground change has taken place which – by its salience – forces the perceiver to identify it. These cases of stimulus-driven identification are independent of purposes and pertinences. As much as the spatio-temporal boundaries of circumstances from sensation are sustained in conceptualization, the competence of engaging successfully in inside-out attribution originates in the experience of outside-in attribution, i.e., in those cases in which the child is not the attributor but undergoes attribution by others. However, outside-in attribution cannot be said to be sustained in inside-out attribution in the same way that sensational differentiations are sustained in conceptual differentiations. It does not supplement sensation in the way inside-out attribution supplements conceptualization, either. Therefore, outside-in attribution is separated from both inside-out attribution and sensation by solid lines.

Figure 3.55 can easily be transferred into the semiotic triangular form known from section 3.3.8. One can also distinguish the production from the comprehension perspective. Figure 3.56 shows the production perspective:

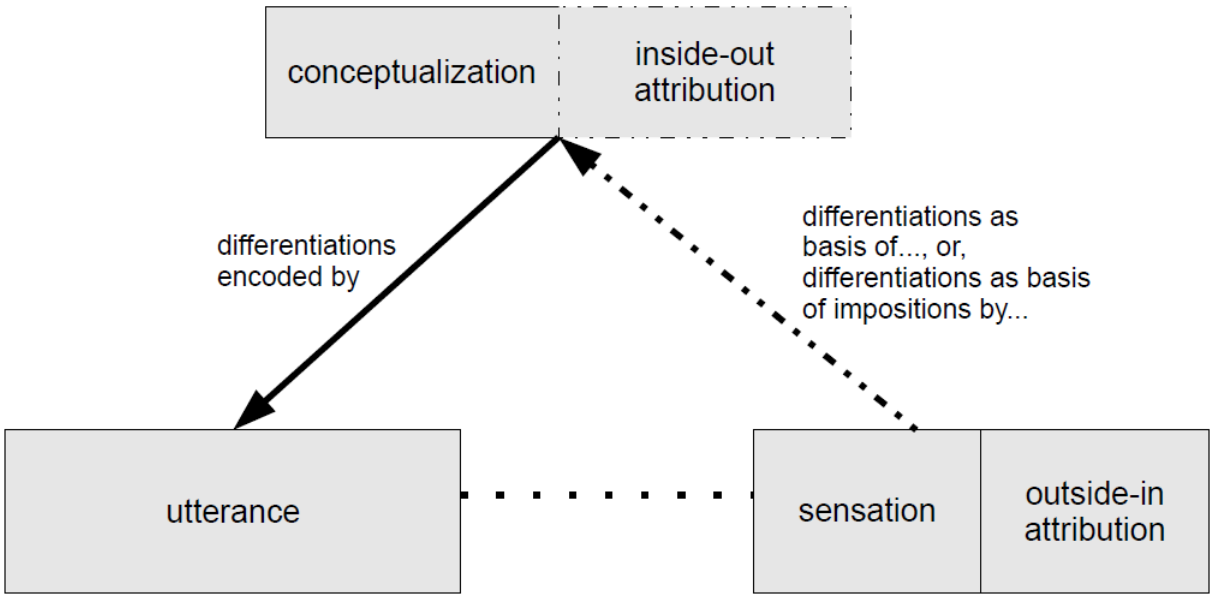


Figure 3.56: What utterances code (production perspective)

The comments on Figure 3.55 also hold for Figure 3.56. The latter additionally emphasizes that utterances code differentiations made in conceptualization which on the one hand originate in sensation but on the other hand do not, namely where they are imposed by attributions. The mediated and non-straightforward, but nevertheless causal relationship between sensation (and outside-in attribution) and conceptualization (+/- inside-out attribution) is symbolized by the dotted arrow. The even less direct relationship between an utterance and sensation is symbolized by a dotted line. The directions of the arrows stand for the assumed order in language production from (if present) sensation over conceptualization (+/- attribution) to utterance. Figure 3.57 depicts the comprehension perspective:

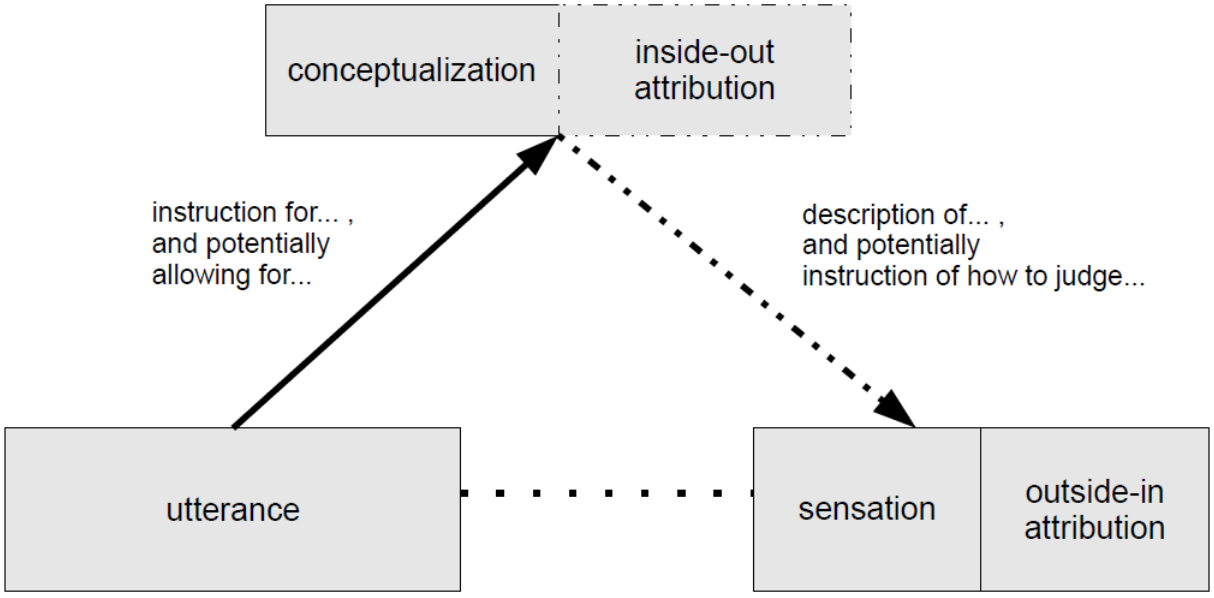


Figure 3.57: What utterances code (comprehension perspective)

The comprehension process is more complex, since for a speaker the to-be-coded concepts and eventually the contents of attribution are definitely known, while for a hearer they are not.

Instead of this, the hearer takes the utterance to be an instruction for a conceptualization (which in the case of hypostatizations cannot be completely obeyed), whereby what he/she conceptualizes eventually – in the case some activity is coded – requires attributions. Because utterances are often and conceptualizations are always underspecified with respect to actional matters (intentions, causes, reasons, dispositions etc.), an utterance either leaves the manner in which some simulated perception is imposed by attributions entirely to the hearer, or it suggests to him/her how to judge the simulated percept from the perspective of attribution: Given a speaker senses and identifies/conceptualizes an event of Peter killing Mary and then utters *Peter killed Mary*, then both the percept, the spatio-temporal conceptualization underlying this event as well as the utterance are underspecified with respect its actional status (agentivity, intention etc.). In this case the manner in which the corresponding simulated perception on the basis of the utterance is imposed by attributions of the hearer is entirely left to him/her. He/she can judge the event as either action or as (mere) behavior of Peter. If the speaker uttered *Peter murdered Mary* instead (which includes a different attribution performance on the side of the speaker with regard to the same event), this suggests how the hearer ought to judge the simulated percept from the perspective of attribution, namely as an agentive event involving action on the side of Peter.[155] It is nevertheless – and crucially – left to the hearer to accept the speaker's attribution as it is externalized in the verb *murder* or to challenge it. But, as a rule, using *murder* triggers a variant of the so-called positive test strategy, a well-known cognitive shortcoming, on the side of the hearer, presumably making it more probable that he/she accepts the speaker's judgment of the event.[156] In the case of using *kill*, on the contrary, this shortcoming is not triggered and the hearer's judgment may turn out to be more accurate.[157]

3.4.7 Transitions and the identity of states, processes, and activities

Returning to the temporal organization of circumstances, the taxonomy of circumstances proposed above, including states, processes, and activities, obviously lacks a unit corresponding to what Pustejovsky (1995) calls "transition" and what van Valin & LaPolla (1997), van Valin (2005), and Croft (2012) call "accomplishment" and "achievement", based on Vendler (1967) (see Levin & Rappaport Hovav (2005), chapters 3.2 and 4 for an overview).[158] Like Croft (1991) but for different reasons I do not assume that such a unit is necessary. I think that any "transition", "accomplishment", or "achievement" – for instance, a

[155] The insight that lexical items – here *kill* and *murder* – differ as to whether they include a statement as to agentivity or not, is the basic insight of the proposals on the "agent" thematic role by Holisky (1987) and van Valin & Wilkins (1996). One of the main goals of the present proposal is the socio-cognitive and conceptual underpinnings of this "lexicological" insight.

[156] See section 3.2.1.4 and the references cited there on the positive test strategy. Here, a variant of this strategy might be involved because perceptual data (to which this strategy was restricted in section 3.2.1.4) are not the critical data with respect to attribution, but rather those determining factors outlined in the sections on attribution.

[157] See section 3.2.1.4 on the relationship between accuracy, economy, and efficiency.

[158] Any theory of the syntax-semantics relationship has descriptive means to capture more or less fine-grained distinctions in the temporal organization of circumstances. Because the disagreements on the research programmatic level between these theories which belong either to Chomskyan or Cognitive-Functional Linguistics traditions, and the theory proposed here are located at a very general level, the technical details of CL's and CFL's event structure theories will not be discussed in detail. See Levin & Rappaport Hovav (2005, chapters 3.2 and 4 for theory-neutral overview).

glass changing from being physically integer to being broken, a door changing from being open to being closed, a balloon changing from being inflated to being popped, or the change from having an idea to having forgotten it – is itself either a process or an activity. Using a common example, a glass being broken (or breaking) does not constitute a transition but a(nother) process linking two states, or two processes, or a state and a process, or a process and a state. Getting up does not constitute an accomplishment but an(other) activity linking two states, two activities, a state and an activity, or an activity and a state. The problem is now that this is not objectively the case. Consider a sub-part of making tea again: Someone's pouring water from a can into a cup can be said to be an activity, but the water's streaming down from the can into the cup can be said to be a process. Is this contradictory? I think the answer is negative and follows immediately from what has been said in section 3.4.5: From the perspective of sensation, the figure/ground change of the water leaving the can, approaching and filling the cup is describable as several circumstances. From the perspective of identification/conceptualization the water's leaving the can, approaching the cup, and filling the cup can be identified/conceptualized as the instantiation of a single process schema. From the perspective of action/attribution the person's grasping and lifting the can, tilting the can, and the water's leaving the can, approaching the cup, and filling the cup can be judged to be an instance of the action schema POURING WATER INTO A CUP.

It is therefore adequate to say that pouring water into a cup is an activity, if this is meant in an action-theoretic sense. At the same time is also adequate to say that the water's streaming into the cup is a process, if this is meant as a conceptual schematization or as a single or as several processes in sensation. Both treatments of partially the same circumstances differ only in aspects, but do not imply objective differences.[159]

As a consequence, any attempt to capture the "meaning" of a verb or co-composed verb-complement structure by means of a semantic decomposition (e.g., Jackendoff 1972 and sqq., van Valin & LaPolla 1997, Wunderlich 1997) reduces the factual complexity of some circumstance(s) like Peter's pouring water into a cup in a way that seems inappropriate in consideration of what conceptualization and attribution performance an interpreter has to accomplish when hearing a corresponding utterance (e.g., *Peter pours water into a cup*) and trying to understand it.

When asked whether Peter's breaking or opening a window was a state, process, or activity, the proper answer would be that this is a matter of aspect, i.e., a question of whether

[159] I think that these explanatory devices are able to capture one of the basic insights of the work on "event structure" by Jeffrey Zacks, Barbara Tversky, and their colleagues (e.g., Zacks & Tversky 2001, Martin & Tversky 2003, Zacks et al. 2007, Zacks & Swallow 2007, Tversky et al. 2011), namely

> "that people do not perceive event boundaries on only one timescale. Rather, they perceive event boundaries on multiple timescales simultaneously but selectively attend to one timescale in response to instructions or other experimental manipulations. According to this view, when activity is coherent, participants segment it at multiple timescales and can choose to attend to finer or coarser grains." (Zacks et al. 2007: 278)

What they call "boundaries on different timescales" mirrors nearly exactly the idea that circumstance boundaries originate in sensation, identification/conceptualization, or attribution, depending on where the respective salient or pertinent differentiations originate.

perceptual (concerning sensation), conceptual, or actional differentiations apply.[160] I take this to be one of the most basic insights about the temporal organization of circumstances. It is also backed by Zacks et al. (2007: 281) who suggest "that movement features may play a particularly strong role in identifying the smallest units of activity but that other features may be important in identifying which of those low-level event boundaries are also boundaries between larger units of activity."
It is then the task of the hearer, or interpreter, of the well-known alternations in (3.36a) to (c) to know which syntactic construction is associated with the differentiations made on which level.

(3.36a) *The window opens/breaks*.
(3.36b) *Peter opens/breaks the window*.
(3.36c) *The window is open/broken*.

In a language like Kalam (cf. Pawley 1993, 2006, 2011) which mostly lacks the lexical means to code complex action schemas like making tea by means of a simple NP-V-NP structure, verbs mostly designate differentiations from the level of sensation, i.e., differentiations very close to simple figure or figure/ground changes like those depicted in Figure 3.51 above. In order to express a complex action this has to be coded by a series of "low-level" verbs ("serial verb constructions"). For instance, expressing that someone fetched some firewood – a complex action schema – must be broken down lexically and grammatically to its component parts – closely corresponding to segmentations in sensation or identification – such that verbs designating GOING, HITTING/BREAKING, GETTING, COMING, and PUTTING must be combined to code the complex concept of FETCHING (cf. Pawley 1993: 95). From the perspective of the present proposal, speakers of Kalam – and those of any other language – of course schematize actions like fetching something in terms of "high-level" action schemas, while they only employ different (conventionalized) strategies for expressing them linguistically^{o} (see section 3.3.4 and Table 2.7 on matters of universality and contingency). Bohnemeyer and colleagues (e.g., Bohnemeyer et al. 2007, Bohnemeyer et al. 2011) have proposed a semi-linguistic^{o} feature for classifying such strategies typologically: the macro-event property (MEP). According to them, "a construction has the MEP if temporal operations such as time adverbials, temporal clauses, and tenses necessarily have scope over all subevents encoded by the construction." (Bohnemeyer et al. 2007: 3). The MEP could thus be considered a conventionalized strategy for coding circumstance segmentations from higher levels. Although the research programme pursued here attempts to avoid inducing cognitive categories of cognizers from linguistic evidence[161], the MEP constitutes a useful criterion for classifying how languages code circumstances, although it falls out of the scope of the present proposal. One can only speculate that some constructions have the MEP because they code schematizations from the identification and/or attribution levels. It is likewise possible that the MEP is part of the idling cycle of syntax, or that it is (partially) otherwise motivated.

[160] Note that this does not mean that aspect is a grammatical category.
[161] Syntactic structures shall be grounded actionally, perceptually, and conceptually, not the other way around (see part I).

3.4.8 “Event headedness”, “co-composition”, and “boundedness”

Consider once more the example of Alex making tea. It has been shown that the utterance *Alex makes tea* embraces temporal segmentations from sensation, identification/ conceptualization, and action (attribution) levels. In particular, the utterance even codes an ancillary action schema in which there is already tea there, namely the last one in Figure 3.54 above in which Alex takes the cup with the teabag into which he has previously poured the water. That means part of the conceptualization underlying *Alex makes tea* consists of some spatio-temporal configuration in which the making of the tea is already finished. One could ask now if it is not inappropriate to (co-)designate a state of there being tea with a verb actually designating the activity of bringing this tea about. (3.37) is an utterance that can accomplish this.

(3.37) *(Right now) Alex is making tea.*

In (3.37) there is not yet tea but the activity of making tea. However, no one would claim that using the verb *make* with the complement *tea* is appropriate only in the present progressive. Contrariwise, one could claim that uttering (3.37) was not appropriate until it was (conceptually/actionally) certain that Alex’ activity was followed by a situation where there was tea. And this is exactly the point. Because if the result of Alex’ activity was stock, and not tea, then it would not have been appropriate to utter (3.37) beforehand. What this line of argument shall illustrate is that (3.37) and any other utterance containing verb-complement structures do not pick differentiations from sensation for coding, and thus do not code objective circumstances in the environment, but that they generally code units from conceptualization (+/- attribution), and in particular schematizations of circumstances, i.e., process, behavior, or action schemas. Remember what has been said about what constitutes an action schema in section 2.4. This is repeated here, applied to the tea scenario: When I have made tea successfully, i.e., there is tea after my acting, then I have actualized the action schema of making tea, since the resulting state of there being tea is the condition for the foregoing action being an instance of the schema “making tea”. As a consequence, uttering that someone is making tea by using the verb *make* and the complement *tea* implies that the cognizer has identified and attributed the actor’s activity to be an instance of the action schema “making tea”, independently of the tense, aspect, and mood of the corresponding utterance.

Identification and attribution includes that of the result of the instance of the schema – there being tea – which determines its identity.

The above problem is closely related to what Pustejovsky (1995: 72ff.) discusses as “event headedness”. He (1995: 72) states, though informally, that “the head is defined as the most prominent subevent in the event structure of a predicate, which contributes to the ‘focus’ of the interpretation. We can view [headedness – SK] as a relation between events […].” In addition, Pustejovsky (1995: 72) assumes that what he calls events has at most two sub-events. In what follows I will try to reconstruct his event headedness by means of the notions developed here. Ignoring for the moment that in Pustejovsky’s proposal states are called

events, too, that "focus" is not defined, and that being able to interpret *Russia privatizes the Soviet business companies* requires at most two sub-events, *make* would be classified as consisting of only one event, a process, where this process would also be the head, because intuitively it contributes the focus of the interpretation. In contrast, *make tea* would be characterized as consisting of two sub-events, a process (the making) and a state (there being tea) with the head being the state, for the same reasons.[162] With respect to the famous commercial event (which is familiar from frame semantics; cf. Fillmore 1977, 2006), *sell* is right-headed, focusing presumably on the customer having the goods, while *buy* is left-headed, focusing presumably on the customer having the goods, too. Both buying and selling occur simultaneously, i.e., they are entirely overlapping, describing different aspects of the same circumstance.

In the present account, *sell* and *buy* designate very different conceptualizations (+ attributions) because conceptualization is simulated perception and therefore perspective-dependent. Figure/ground and trajector/landmark distribution are more or less reversed in both events. Because from a perceptual point of view there are no symmetric events – figure/ground segregation is necessary and necessarily asymmetric – the buyers and sellers are attributed being engaged in instances of different action schemas, respectively. Headedness is nothing more than the *definiens* of selling and buying, respectively, namely that the action schema of selling or buying has been actualized such that the customer has the goods, where these actional considerations operate on largely different spatial conceptualizations, which are part of what *sell* and *buy* (together with their complements) designate, respectively. They cannot be conceptualized and attributed at the same time by the same actor/cognizer.

Going a little bit more into detail, reconsider what has been said in section 3.3.2 about the regularities of spatial conceptual structure-syntactic structure mappings: Some circumstances allow alternative lexicalizations, e.g., symmetric verbs, some so-called psych-verbs, and the commercial exchange verbs. These alternatives originate in the comparable figure-aptness of the involved objects (e.g., in the case of *resemble*) or they lexicalize what has been called inversed mapping, in which not an iconic conceptualization process of a figure's state/movement/motion relative to a landmark is lexicalized (as in *x is at y*, *x moves to y*) but rather the simulated eye gaze of the conceptualizer who is examining a concept (as in *y has x*, *y gets x*). These alternative lexicalizations are thus characterized by an inverse mapping between trajector/landmark and the PSC and oblique cases in that the landmark is realized as PSC (as in *get sth*., *have sth*., *miss sth*. *obtain sth*. etc.). In the previous paragraph I have outlined that the identity of a circumstance (its being an instance of a schema) depends on its result as identified/attributed.

The result of a circumstance can now be said to be closely related to the role of the landmark in this circumstance, i.e., where something is located or moves is identifiable only with regard to the landmark. In other words, landmark and circumstance result, circumstance result and circumstance identity, and therefore landmark and circumstance identity are closely associated: With respect to the way a verb (+ complements) codes some circumstance, the

[162] But note that both *make tea* and *build a house* involve "incremental themes", and that the latter is analyzed by Pustejovsky (1995) as left-headed (i.e., process as head) event; see the discussion later in this section.

"head" (in Pustejovsky's terms) of the coded circumstance depends on how the verb lexicalizes its landmark, namely either as a PSC or as an oblique complement:

For verb-complement structures expressing both trajector and landmark, verbs whose PSC codes a landmark would be left-headed in Pustejovsky (1995); verbs whose PSC does not code a landmark would not be left-headed. Right-headedness consists in the fact that with the corresponding verbs (+ complements) the landmark of a state/motion/movement in the penultimate or ultimate sub-part of the circumstance on the conceptual/actional level is coded either as an oblique NP or PP.

Pustejovsky's examples for right-headedness are *arrive*, *sell*, and *walk home*. Their oblique complements are NPs or PPs and they indeed code landmarks of the penultimate or ultimate sub-parts of the respective circumstances: Approaching or being at the final destination (i.e., landmark) is encoded as a PP with *arrive*, the goods approaching or being at the buyer (i.e., landmark) is encoded as NP PP/NP NP with *sell*, approaching or being at home (i.e., landmark) is encoded as NP with *walk home*.

Pustejovsky's (1995) first example for left-headedness is *buy*. In *buy*, the landmark is encoded as PSC, as predicted, because the buyer is the goal and location (i.e., landmark) of the good in the penultimate and ultimate sub-part of buying, respectively. The second example is *build*, and this is more puzzling, since its oblique complement is an "incremental theme" (Dowty 1991) or "measuring out the event" (Tenny 1992) or "bounding" the event (Jackendoff 1996): The coming into existence of a house is co-extensive with the activity of building. It is therefore difficult to determine the house's role as landmark in the activity of building a house. From the perspective of the attribution of an action schema, building a house is unproblematic. The attribution of the result marks its identity. But on the conceptual level it is more difficult. On the basis of the fact that the PSC of *build* does not code a landmark, I am forced to conclude that *build* is not left-headed.

The above generalizations obviously apply only to verb-complement structures expressing both trajectors and landmarks, i.e., circumstances that are located or directed towards landmarks. What about utterances like *John walks*, *John dances*, *John is sick, The clock goes off* which do not (explicitly and necessarily) have results and do not express landmarks which could serve as the defining characteristics of the respective circumstances? Here I assume that interpreters attribute these activities to be actions with ends in themselves, unless co-text and common ground information suggest something different; in the case of states and processes I assume that interpreters identify them with their results, i.e., they treat the state of John's being sick and the process of the clock beeping at the same time as the result of these states and processes.

It is the role of the landmark, then – whether it is a location or direction of the figure (as in *be at home*, or *go home*), whether it is an object with which the figure interplays/interacts physically (as in *get sth*. *sell sth*., *hit sth*.), whether the landmark changes some feature, state, or location (as in *build a house*, *drink a glass of beer*, *mow the lawn*), and whether some landmark is expressed at all (which it is not when *someone dances*, *beeps*, *stinks*, or *is lazy*) – which is determinative of the identity of the circumstance and which to a large degree co-determines its temporal organization in terms of its "holism", "incrementality", "bounding", "measuring out" and "affectedness" (for an overview cf. Levin & Rappaport Hovav 2005 on

"aspectual approaches" and the references cited there). And as alternative lexicalizations of circumstances show, it is not only oblique complements (i.e., grammatical objects) expressing landmarks that have this status, but also those verbalized as PSCs (cf. Jackendoff 1996). The crucial role of the landmark will be captured here by refining the symbols for the landmark. This is given in Figure 3.58:

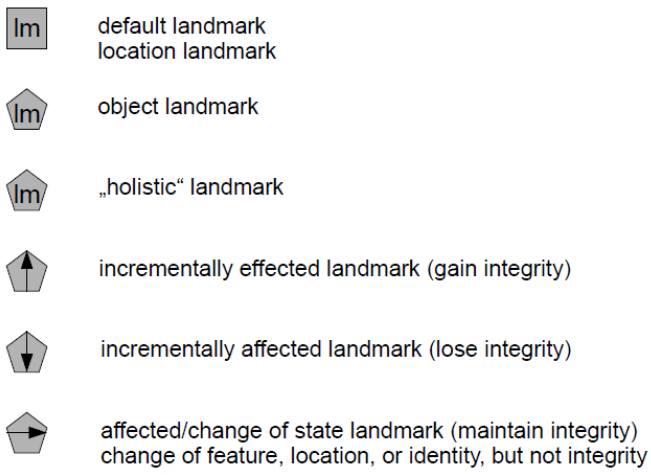


Figure 3.58: Types of landmarks (final version)

Concluding this section, (3.38) to (3.41) list some exemplary utterances containing holistic, incrementally effected, and affected landmarks as well as change-of-state landmarks, respectively:

(3.38) *Alex likes George.*	holistic landmark
(3.39) *Alex blows up a balloon.*	incr. effected landmark
(3.40) *Alex crumples the paper.*	incr. affected landmark
(3.41) *Alex loads the wagon.*	change of state landmark

What I suggest, then, is that characterizing conceptualization as simulated perception and making it dependent on the workings of mainly visual perception brightens up much of what seems nebulous about the role of traditional themes/patients in aspectual considerations. One need only take into account as what some observed circumstance is identified/conceptualized or attributed (e.g., as a circumstance of making tea) and how the landmark behaves in that circumstance (does not change, changes some feature/its location, goes out of existence, comes into existence).

3.5 On the significance of verbs and circumstances

- This rather short section takes some of the central ideas as outlined in sections 3.1 to 3.4 and sketches their consequences for the relationship between verbs and circumstances. At the same time, it connects the previous sections on the general principles of the syntax-semantics

relationship with part III in which I discuss specific aspects of that relationhip and the linking competence.

In particular, the actional, perceptual, and conceptual devices developed so far allow us to reconstruct most of the traditional notions considered to play a role in the linking problem, i.e., in the relationship between syntactic forms and conceptual contents (+/- attributions). One of the essential ideas pushed forward in previous sections was that circumstances of objects or between objects are in a sense inherent to the objects, namely as affordances which in turn depend on the features of the object(s). They are not objects themselves because – to put it roughly – they do not make retinal images. In other words, circumstances express themselves only in objects. For the "semantic" side of the syntax-semantics relationship – comprising actional, perceptual, and conceptual differentiations – this means that circumstances are in part secondary to objects, i.e., logically as well as conceptually downstream objects. It is impossible to think of or conceptualize some polyadic and/or complex circumstance – event, process, activity, or relation – without thinking of some thing by which it constitutes itself.

One could call this the pivotal role of objects in semantics.

Looking now at the syntactic side of the syntax-semantics relationship we find these roles reversed. There is no doubt that the verb is the critical element upon which crucial aspects of a syntactic structure largely depend, namely in terms of government (cf. Moravcsik 1993), dependency (cf. van Langendonck 2003), syntactic valence (cf. Ágel 2000), subcategorization (cf. Chomsky 1981) and also agreement.

In consideration of these facts one can talk of the pivotal role of verbs (besides mainly adjectives and prepositions) in syntax.

The following quotes illustrate this.

> "Thus it is the valency of the verb which determines how many other elements the construction may or must have […], not the valency of an object which determines that there must also be a subject and a verb or the valency of the subject which determines whether there may also be a verb and a direct object." (Matthews 1981: 100)

> "The verb not only determines the case of its direct term arguments, it also specifies the number of dependents and in many instances some of their properties. […] Adpositions and verbs determine properties of their arguments, not the other way around, and therefore they are the heads." (van Valin 2001: 87)

> "In some constructions, one slot has a special status in that the items that can fill that slot must be listed in the lexicon, while its sister constituents are not so constrained. These are instances in which one constituent is SUBCATEGORIZED with respect to its ability to occur with a particular set of sister constituents." (Zwicky 1985: 5)

The reversal of the dependency relationships between semantics and syntax is captured in Figure 3.59 below:

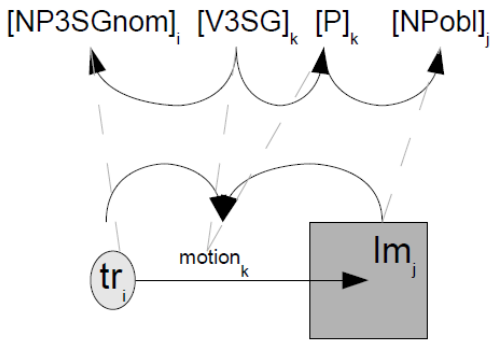


Figure 3.59: Dependency reversal

The arrows indicate the relations from the independent to the dependent units. One could think of *The ball rolls into the room* as a possible instance of the construction depicted. Irrespective of whether one deals with a head-marking or a dependent-marking language, it is the verb which determines certain formal properties of the dependent elements like their very occurrence, their morphological case, or their word category. These properties serve the encoding and decoding of the definitive circumstance of one or between more objects, or – simplifying matters – what some would call the "who did what to whom". The presentational format of written, spoken, or gestural language forces conceptual (+/- attributional) matters into linearity such that what is actually synchronous must be presented asynchronously, in particular by means of grammatical morphemes and/or restrictions in word/phrase order. (Another possibility is leaving the coding of circumstances ambiguous where their concrete conceptualization is left to co-textually or non-linguistically^{o} induced inferences.)

What manifests itself conceptually in nothing but the involved object(s), namely the circumstance, is phonetically, graphically, or gesturally materialized as verb (+ preposition) and thus as the organizational center of the sentence.

Contrariwise, conceptualization does not work with symbols, does not code anything, does not present anything, but is simply the simulation of perceptual experiences. It has thus no grammar and no signs with any morphology but in conceptualization anything is what it is.

A circumstance is literally nothing but an actualized affordance of some object(s), an aspect of it or them. It has no "form" outside that of the involved object(s) – there is no analog of a verb in conceptualization.

From this perspective the verb opens a relation to its complements although their designations have entirely different states than their material manifestations. Strictly speaking, linguistic^{o} expressions for relations – among whose verbs are the primary instances – must be considered hypostatizations:[163] Conceptually, it is nonsensical to say that some object bears some relation to a circumstance, while it is perfectly okay to say that a verb bears some syntactic relation to its complements. As has been mentioned, this special instance of hypostatization is *quasi*

[163] This is not valid for the circumstance of an object when one attempts to conceptualize it as standing in no circumstance – which is of course a circumstance.

maximally motivated by the necessarily linear and temporally ordered nature of the symbol system.
Because of this it is conceptually – and consequently with respect to some notion like the mental lexicon – simply not possible to source out into verbs the conceptual "load" of object concepts in conceptualizing circumstances. The consequence is furthermore that the contribution of verbs to conceptualization is diminished to the role of relating object concepts to one another and specifying their relationship which is in principle already present in the potentialities of the involved objects in the form of their (mutual) affordances. Verbs are what narrows down and mostly definitely picks out one of these potentialities by assessing its actuality, while the others remain potentialities that are discarded for the moment. Co-composition should be understood in this sense: The heavy load of conceptual composition is carried by object concepts which are realized as nominal expressions.

3.6 Summary of part II

Remembering the model underlying the research programme proposed in part I (Figure 2.3), "theories of competences and interaction" range at the species/community level. These theories are supposed to contribute to the explanation of the linking competence by means of converging evidence (Figure 2.4). With respect to the linking competence they take the form of sub-competences. The linking competence in turn should test these theories in that it draws from their modes of functioning (partially, at least). Explaining the linking competence is thus a multidisciplinary undertaking. The goal of Part II was to characterize these sub-competences on the species/community level and to relate them to syntactic structures on a general level.
The first sub-competence (section 3.1) presented was perception. It splits up in bottom-up sensation and top-down identification/categorization (3.2). It turned out that the percept is fundamentally underspecified with respect to several types of information that are relevant for linking. Several biases in top-down identification – matching percepts with concepts – have been identified. With the help of neuroscientific evidence, conceptualization – as the second sub-competence – was then characterized as simulated perception and/or action. The crucial notion of affordance has been deduced. Because of the simulation rationale, the underspecification of the percept applies to concepts and conceptualization, too. The information types with respect to which percepts and concepts are underspecified are mainly those that are important for an assessment of circumstances in the causal and actional, or social, realm. Causality has been reconstructed on the basis of a covariation model and a re-enaction proposal. With respect to actional matters the actor/cognizer has been demonstrated to be a self-serving pragmatic that does not rely on scientific methods to make his/her judgments about circumstances. On the basis of sociological and social psychological evidence an attribution theory – as a third sub-competence – has been developed by means of which actors/cognizers "close" percepts and concepts in accordance with a "large-scale" law of closure. In this way, actional matters, i.e., attributions, are imposed on spatio-temporally restricted and thus underspecified percepts and concepts. The working of attribution and its effects on linguistic^{o} structures have been demonstrated in a case study.

Moving away from the sub-competences and closer to the linking competence in the model underlying the research programme, conceptualization could be shown to have an internal structure in terms of trajector-landmark configurations (3.3). On the basis of its structural organization, conceptualizations can be related to the structures of utterances. The idea of the utterance as an instruction for simulating a perceptual experience was developed. Motivated – on the basis of diagrammatic iconicity – and exploiting – pretending diagrammatic iconicity – conceptualization-syntactic structure mappings have been extensively discussed, including their acquisition modes, their internal logic, and their limits. Syntactic structures have been described with the help of the construction notion, constructions being the formal units exhibiting diagrammatic iconicity to circumstance types.

The notions of adicity and complexity were meant to clarify the internal temporal organization of circumstances (3.4). These segmentations are applicable to several levels of descriptions, namely (from bottom to top) sensation, identification, attribution, and language. Circumstance segmentations on higher levels turned out to respect segmentations from the lowest level(s), but not the other way around. Language has the power to compress innumerable low-level segmentations into single utterances, forcing interpreters to decompress the conceptualizations underlying the respective utterance. Within single circumstances and constructions the role of landmarks and their expressions are of central importance, respectively. The status of the landmark is what fixes the back end (telicity) of circumstances and gives them their identity in terms of motion or movement schemas. Using the notion of affordances and the significance of the landmark in circumstances, the role of circumstances in semantics has been downgraded in favor of the role of objects. Because of its character as a semiotic system, language reverses this dependency relation at the expense of objects and in favor of verbs (or adjectives and prepositions).

Part III: The linking competence

Introduction

In the final part of this work the many and manifold explanatory notions and devices from the previous chapters are brought together in order to demonstrate how their interplay constitutes the crucial part of the linking competence – the ability to encode and decode concepts of potential and actual states, processes, and activities by means of verb-complement structures that are both well-formed and appropriate. The notions and devices will be used in the following to model the linking competence in a phenomenon-oriented way. The glossary at the end of the book provides an overview of the most important of these notions and devices.

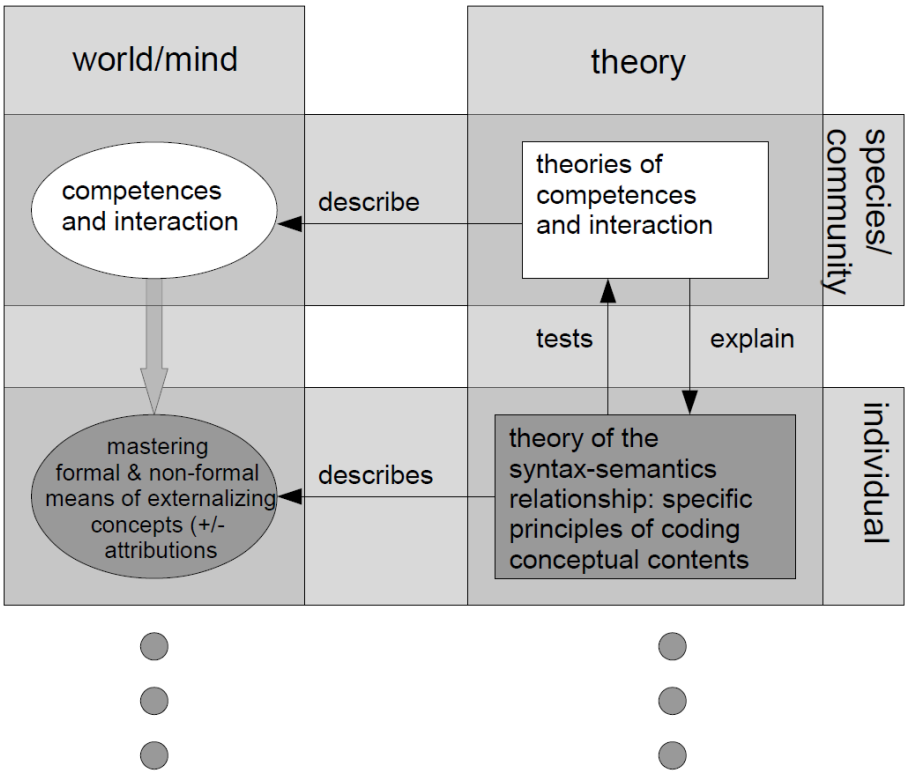


Figure 4.1: Mastering the formal and non-formal means of externalizing concepts (+/- attributions) as parts of the linking competence that are developed in sections 4.1 and 4.2

- With respect to the research programme, we are at the heart of the model now, its subject-matter in the narrow sense: the individual level on which the theory of the syntax-semantics relationship describes the linking competence. This is depicted in Figure 4.1

4 Linking syntax and semantics

Let us first reconsider briefly what linking exactly means on the basis of the previous chapters:

In Instruction Grammar, linking is the well-formed and appropriate employment of parts of speech, morphology, and word order by actor/cognizer/interlocutors in an actual utterance such that this utterance can be utilized (i.e., when motivated) as an instruction to simulate a perceptual experience of a circumstance and to eventually perform a corresponding attribution with respect to the actionally underspecified concept of that circumstance.

The "nature" of language as a means for organizing praxes requires the sufficient similarity of the conceptualizations and eventual attributions of the interlocutors for the sake of its serviceability. This bears two main problems:
Firstly, it has been shown that the nature of languages as symbol systems makes them imperfect, i.e., not fully specified, public, means for externalizing in a sense "perfect", i.e., fully specified, private, conceptualizations plus attributions. In utterances (e.g., *The child is crying*) and even more in their linguistic^{o} structures (NP_{nom}-V) the experiential richness of any possible conceptualization (and sensation) of a crying child is schematized and thus reduced, simplified, and condensed to invariance. Utterances and constructions code as identical what is different in perception and conceptualization. This is hardly ever considered in many theories of linking, mainly because perception is mostly – and understandably – not part of them. Two interlocutors will – due to the perspective dependence of any (simulated) experience and due to different top-down identification processes – never have identical percepts or concepts of "one" circumstance.

When talking about such circumstances they live in the illusion of understanding each other in the sense of having similar conceptualizations of them.

This illusion persists as long as there appears no fundamental, verbally or non-verbally mediated disagreement about some circumstance, e.g., some inappropriately answered question, or some inappropriately executed command.[164]
Secondly, it has been argued that most verb-complement structures do not code agentivity (unless lexically; think of *kill* vs. *murder*). What is true for conceptualization is then also true for attribution: Interlocutors believe they make similar attributions to the animate objects coded in some utterance as long as their verbal or non-verbal discourse succeeds. This is an instance of the illusion of understanding, too.
These two aspects constitute the reason why the word "meaning" has been avoided in this work where possible, except for the purpose of reporting other theories. In CFL "meaning" is conceptualization. Because conceptualization is private, meaning must be, too. I think this treatment falls short of the meaning (= significance, relevance) of "meaning". My proposal is that the meaning of an utterance is not identifiable. Rather, it can only be formulated negatively:

The meaning of an utterance is what did not let fail the interaction, or alternatively, the meaning of an utterance is what sustains the illusion of understanding (cf. Bailey 2004).[165]

[164] That is, some failed instances of requesting, informing, and sharing which are the basic motives of communication (cf. Tomasello 2008).

All this shows that not only verbs, or in general, lexical items as atomic units, are underspecified (cf. Pustejovsky 1995 and the examples in (2.1) to (2.3) in section 2.1.2). Even in co-composition the elements making up an utterance remain fundamentally underspecified for the above reasons. This means that taking an utterance as instruction for conceptualization (and attribution) involves more than relying on the syntactic form. This is illustrated in Figure 4.2. As a context for the situation depicted imagine the person on the left (speaker) has talked to the person on the right (hearer) about all the things that Willi did that day, when the speaker comes to utter ... *als Willi die Lampe getroffen hat* (speech balloon).

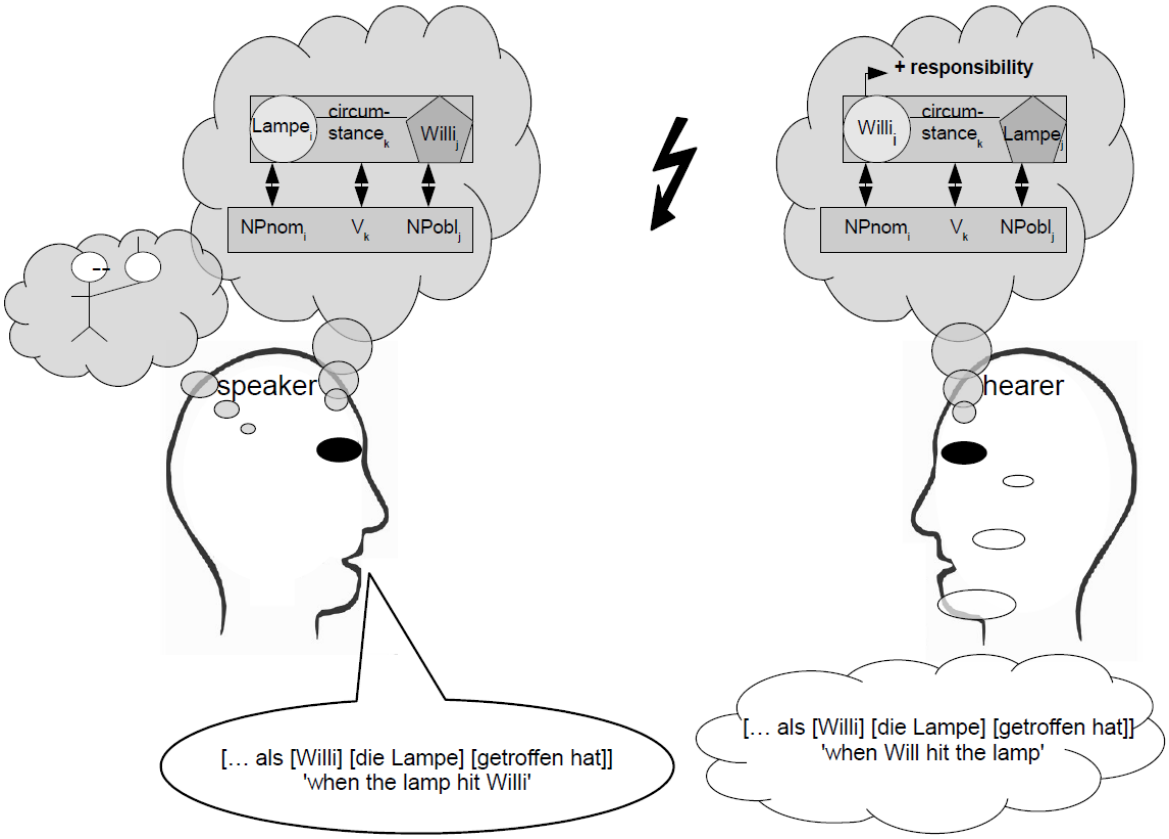


Figure 4.2: Multiple underspecification

The scenario depicted in Figure 4.2 can be described as follows: Earlier that day the speaker has perceived that a person named Willi was hit by a lamp. The percept of this event is underspecified in that it contains no actional (i.e., attributional) information. The speaker, however, has identified the spatial structure of the event, the causal relation (re-enactment of force, spatial and temporal contiguity) between the lamp and Willi, and has not attributed Willi responsibility. In contrast to the percept and the (spatial) concept (depicted by the "modal" cloud), only the concept plus attribution fully specifies the pertinent aspects of the event. The motivated mapping of the conceptualized event (plus attribution) to a linguistic[o] structure (depicted in the "mapping" cloud) results in the speaker's utterance *...als Willi die Lampe getroffen hat* 'when the lamp hit Willi' with the structure NP_{acc}-NP_{nom}-V (depicted by

[165] Although it is possible to understand some action in terms of being able to identify the purpose to which it is a means, it is hardly possible to conceptualize this person's purpose identically to that person's own conceptualization.

the speech balloon). This shall serve for the hearer as an instruction for simulating the same experience that the speaker had. However, the speaker has ignored that *Willi* and *die Lampe* are ambiguous with respect to case such that their form can indicate both nominative and accusative, respectively, and can thus result in a reverse mapping between the NPs on the one hand and trajector and landmark on the other hand. Because word category, case morphology, agreement, and word order are the grammatical means for coding conceptualizations, the structure of the utterance allows the hearer to identify *Willi* (bearing nominative and agreeing with the verb) as trajector and *die Lampe* (in oblique, i.e., accusative case) as landmark (depicted by the hearer's mapping cloud), thus resulting in an utterance in which Willi hit the lamp (depicted in the hearer's thought cloud). In this case the hearer uses this utterance as an instruction to build up the respective conceptualization including its spatial and causal (re-enactment of force, spatial and temporal contiguity) structures. Furthermore, he/she may attribute Willi responsibility for his hitting the lamp. This is depicted in the hearer's mapping cloud. His/her interpretation can be expected because of the "subject preference" (see section 4.2.1) and because up to this point the speaker has talked about things Willi did this day, so that the hearer expects this to continue rather than things happening to Willi. This illustrates that the utterance and its underlying formal structure are as underspecified to the hearer as the percept was to the speaker. In addition, the hearer performs an attribution the speaker could not make because in the latter's concept Willi undergoes force instead of exerting it and the lamp does not afford movement by itself.
Although these conceptualizations (plus eventual attribution) differ crucially, it is possible (though certainly improbable) that this remains undetected in the discourse for some reason or other. Then the interlocutors proceed with the illusion of having understood each other.

Perhaps ironically, then, only what is private is not underspecified, namely the concept plus attributions.

- This chapter is structured as follows. With the shortcomings of the formal means of coding conceptualizations and attributions in mind, the next section discusses the contributions of the central formal units to the en- and decoding of semantic (=conceptual and attributional notions originating in sensation and sociocultural praxis) contents. Although there are many utterances that are formally underspecified like in the above example, misunderstandings seem to be relatively rare. Therefore section 4.2 deals with strategies of reducing the formal underspecification of verbal utterances. In section 4.3 the general principles of encoding circumstances by means of verb-complement structures are presented from an (partially) incremental perspective. The same happens in section 4.4 for the decoding of utterances. The final section then serves to implement these strategies using the example of verb-complement structures from German that are instances of "classical" linking problems.

4.1 The division of labour of the formal constituents

In the following sub-sections the role shall be clarified that the formal constituents making up a syntactic construction contribute to (the illusion of) understanding each other, i.e., to the fact that utterances function as instructions for simulating perceptual experiences that can be imposed by attributions. The presentation will be limited to motivated instances of language use and will be rather general.

I am clear about the fact that breaking down the constituents of constructions in the manner of the following sections is *stricto sensu* an inadequate reduction. When discussing the contribution of the "bare" construction (irrespective of inflectional morphology) in the next section some aspects of the contribution of, for instance, word/phrase categories must be anticipated, although the constructions and the phrase categories they consist of are inseparable. However, I deem this a convenient manner of presenting the main contributions of these constituents. The presentation takes the utterance-as-instruction-for-simulating-a-perception view literally: The interpretation of a spoken utterance takes place as it is uttered and mostly long before it is completed. The interpreter cannot remain indifferent to incoming parts of the speech stream and "wait" for all elements making up an unambiguous circumstance before he/she begins to interpret them, but he/she makes predictions with regard to this circumstance at any point in the time of the utterance, thereby using any clues available to maximize the efficiency of his/her prediction (cf. Marslen-Wilson 1973, Crocker 1994, Stabler 1994, Bornkessel-Schlesewsky & Schlesewsky 2009a, 2009b). In this way the interpreter builds up a circumstance concept using formal constituents. The following sections shall illustrate how this works.

4.1.1 The "bare" construction (irrespective of inflectional morphology)

> A construction is the formal means to code in a diagrammatically iconic way how the conceptualization of some circumstance is organized in terms of trajector and landmark.

This circumstance can be some simple or complex, monadic or polyadic state, process, or activity of something relative to something (relative to something). Conceptualization is organized in terms of trajector-landmark configurations which are grounded in figure/ground configurations from sensation. With respect to the verb-complement structures in question the above-mentioned formal means making up a construction are mainly syntactic categories like, for instance, a noun phrase together with a verb and another noun phrase or a prepositional phrase (plus their inflectional and agreement morphology).

NP_{nom}-V	NP_{dat}-V	NP_{nom}-V-NP_{acc}	NP_{nom}-V-NP_{dat}-PP	NP_{nom}-V-NP_{dat}- NP_{acc}
NP_{acc}-V	NP_{nom}-V-NP_{dat}	NP_{nom}-V-PP	NP_{nom}-V-NP_{acc}-PP	NP_{nom}-V-NP_{acc}- NP_{acc}

Table 4.1: Constructions

The important point is that the construction gets its significance for linking only through the combination of several of these categories. The most important of these combinations in terms of constructions are listed in Table 4.1. For a construction to code a conceptualization of some circumstance accurately with respect to communicative requirements it must allow building a schematic concept of the objects making up the circumstance. A "bare" syntactic construction (lacking morphological information) consisting only of an NP and a V can thus be said to have – however schematic – conceptual import in that it signals a trajector or landmark involved in some circumstance. A construction with three NPs and a V signals the involvement of three objects one of which functions as trajector, one as landmark, and one as trajector and landmark in different sub-parts of the circumstance. The circumstance can with high probability be identified as a relation in which something (metaphorically) moves thanks to some trajector's activity to an object-landmark and/or this happens to the (dis)advantage of the latter. The range of conceptual differentiations with which a bare construction is functionally charged is thus quite variable. While a bare construction like NP-V can presumably code any type of monadic circumstance (and even circumstances with null adicity, e.g., weather verbs), which then may hardly have any conceptual commonalities, the NP-V-NP-NP construction is far more restricted in the number of circumstance types that it codes. In the case of a motivated mapping it is used to code circumstances in which something undergoes transfer from something (most probably someone) to something (most probably someone) (cf. Goldberg 1995, Primus 1999, Newman 2005, Barðdal 2007).
By way of example, the types of monadic circumstances a bare NP-V construction can code is indicated by Figure 4.3.

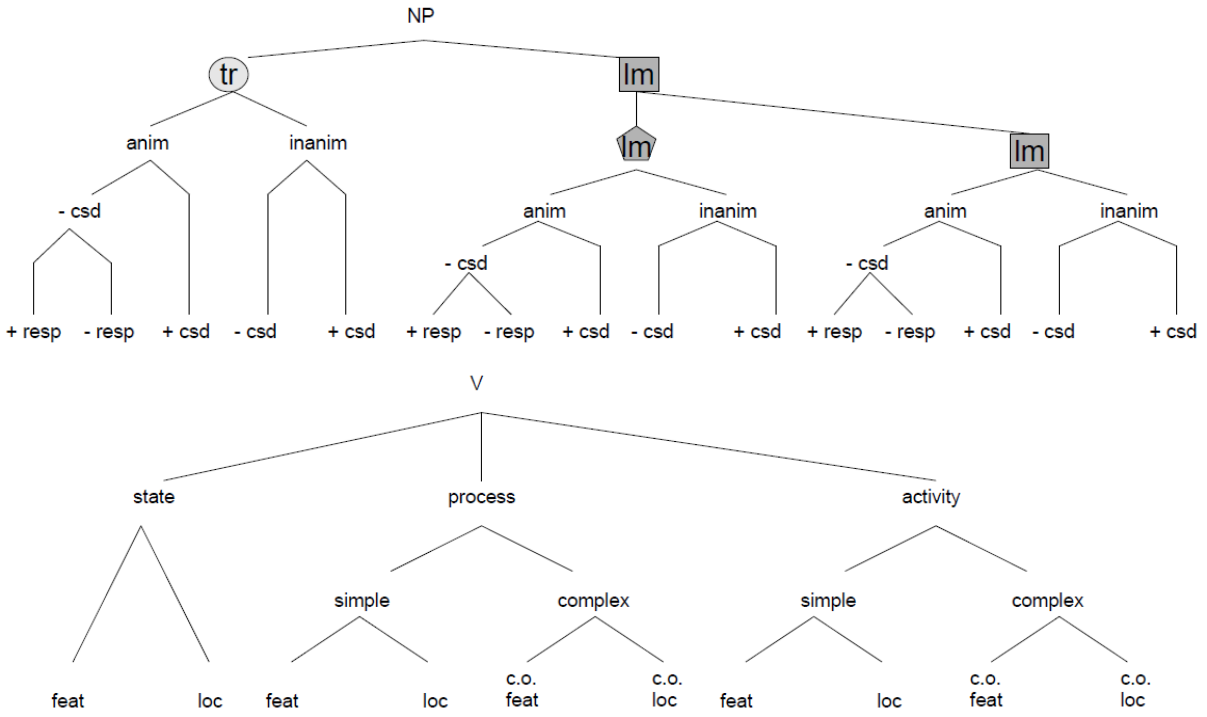


Figure 4.3: NP-V homonymy and polysemy

The upper tree captures the semantic (i.e., conceptual + attributional) potential of the single NP in the construction: It may code a trajector, an object-landmark or a location-landmark. In

each case this element can be animate ("anim") or inanimate ("inanim"). If animate, its circumstance can be caused ("+ csd") by some other thing or it can be uncaused ("- csd"). If uncaused, the element can be attributed responsibility or not ("+/- resp"). If it is inanimate, its circumstance can also be caused or uncaused but attribution does not apply. Any terminal element is thus a possible semantic correlate of the NP. Conceiving of homonymy and polysemy as poles on a scale, one could say that the two topmost nodes in the tree (i.e., tr and default lm) constitute two possible but rather loosely related semantic correlates of the NP which therefore exhibits considerable homonymy. The binary branches of each the tr and lm nodes (animate vs. inanimate and object-landmark vs. location-landmark, respectively), can be seen as motion towards polysemy. The terminal nodes under a maximal node (e.g., the five terminal nodes under the tr node) can be conceived of as being more polysemous and less homonymous.

The same considerations can be applied to the lower tree which depicts an aspect of the familiar circumstance taxonomy: The verb designates a state, process, or activity. The latter are either simple or complex. If complex, there is some change of ("c.o.") some feature ("feat") or (metaphorical) location ("loc"). If simple, all three sub-types of circumstances concern either some feature or some (metaphorical) "being located".

The range of different circumstances that can be coded by the bare NP-V construction can thus be conceived of as a matrix made of the multiplication of the terminal nodes in the NP tree and the terminal nodes in the V tree. Determinative of the high constructional homonymy are the binary and ternary branches in the top of both trees, respectively.

Applying this rationale to the NP-V-NP-NP construction results in Figure 4.4.

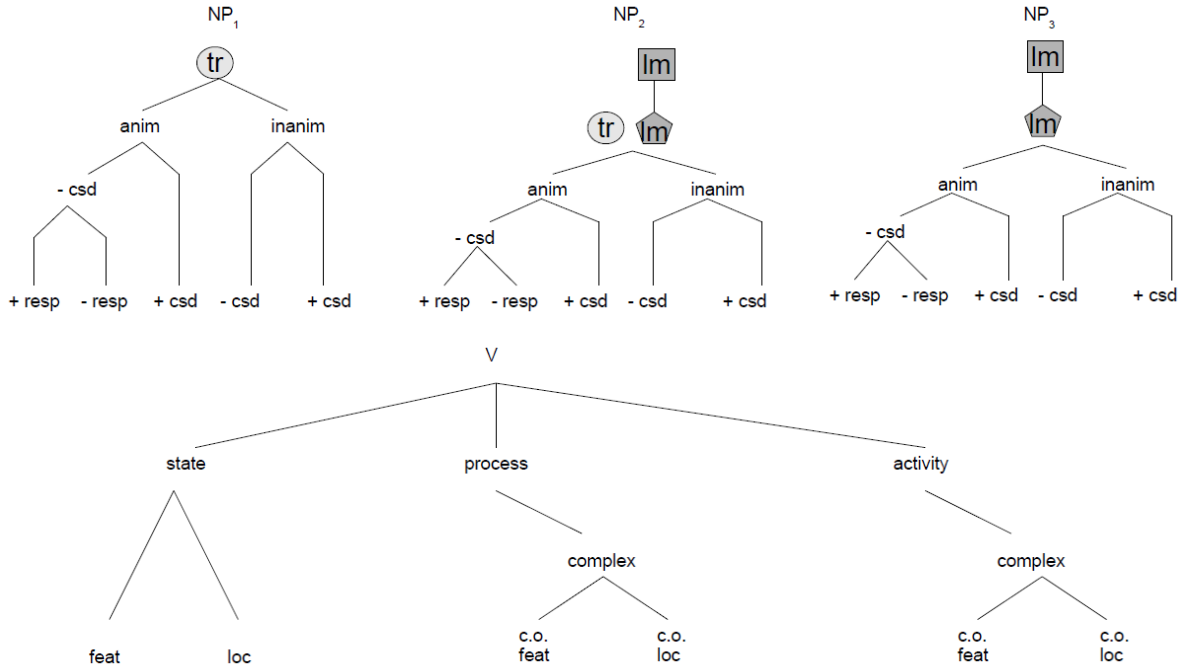


Figure 4.4: NP-V-NP-NP homonymy and polysemy

If viewed in relation to V and independently of the other NPs, each NP in this construction can in principle code the same range of semantic differentiations as the single NP in the NP-V construction. But because the identification and conceptualization of circumstances depends on the identification and conceptualization of features and mutually dependent affordances of

the involved objects, the increasing number of involved objects decreases the range of circumstances that can exist between these objects and those that a language conventionally codes. This is the reason why the range of semantic differentiations an NP may designate in a triadic relation is reduced considerably, namely to the transfer concept mentioned above. This logic illustrates why the contribution of a construction to understanding utterances must be viewed differently from the contribution of each element making up the construction (see also Glenberg & Robertson 1999, Glenberg & Kaschak 2002; see Spivey et al. 2002, Chambers, Tanenhaus & Magnuson 2004 on how mutual affordances reduce ambiguities).

4.1.2 The "bare" noun in the NP and PP (irrespective of inflectional morphology)

I have argued that the bare syntactic construction potentially indicates a type of circumstance, albeit schematically, that the actual utterance designates. In the case of monadic constructions this potential is very weak, in the case of triadic constructions it is considerably higher. Presenting the contribution of the bare construction to the utterance-as-instruction already had to partially include information about the objects involved, namely trajector and landmark information. Now, in motivated mappings, nouns in NPs or PPs designate trajectors or landmarks. In cases of exploitation, decoding nominal expressions requires additional conceptualizations (see section 3.3.7). Motivated language use allows treating utterances as instructions for simulating (visual) perceptions. As trajectors and landmarks (the notions of which originate in figure and ground in perception), nouns within NPs and PPs make their own contributions to the sufficient sharing of conceptualizations and attributions.

To recapitulate, features in sensation integrate to objects with the help of the gestalt laws. The pertinence of objects in identification/categorization and conceptualization co-determine to which features an actor/cognizer attends. It is on the basis of these features that objects afford circumstances. The range of circumstances an object affords is restricted by the identified or conceptualized features. What an object affords to an actor/cognizer is thus dependent on the features of the object itself and on the role it is playing in some ongoing discourse, especially in the plans and purposes of the actor/cognizer. The same is true for any nominal expression uttered in such a discourse: Independently of the syntactic context, i.e., of some circumstance expression and other nominal expressions, an NP is interpreted to designate either a trajector or an (object or location) landmark that is animate or inanimate, caused or uncaused, attributed to be responsible or not to be responsible, as Figure 4.5 indicates. Each terminal node constitutes a form of appearance of the semantic correlate of a nominal expression, and that independently of its features (i.e., those that are features in perception).

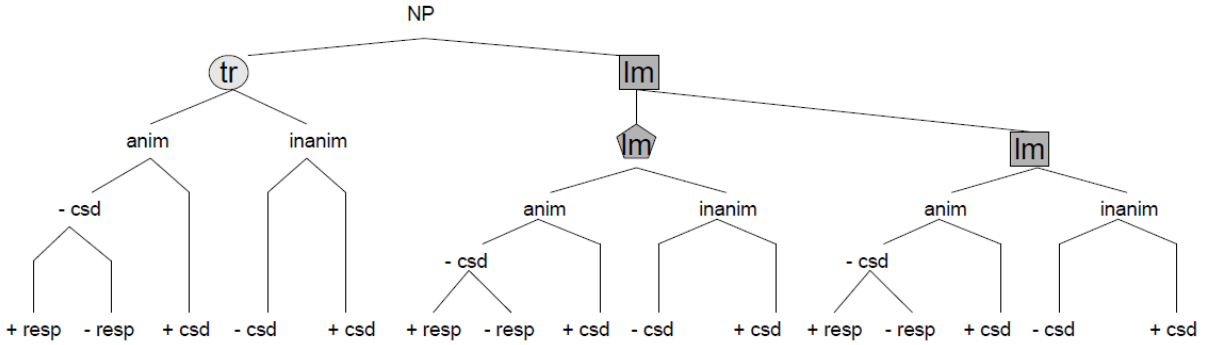


Figure 4.5: NP

Importantly, the object concept to which the NP refers exhibits affordances independently of the syntactic context, too. Not only does the actor/cognizer simulate the corresponding perception when hearing some nominal expression but this simulated percept also affords some circumstance to the actor/cognizer on the basis of what is pertinent about the object to him/her.

For instance, a ball does not only afford motion, i.e., some circumstance that is a process, but it affords, for instance, motion which inherently goes along a path, it affords some manner of motion on the basis of some pertinent feature, e.g., motion by bouncing or rolling, and it affords exertion of force in that it may hit some other object. This is the point where perceptual features come into play. (They are not depicted in Figure 4.5.)

The object concept underlying some NP encountered in an utterance by an interpreter certainly has quite a number of affordances. The affordances of an object concept underlying some nominal expression can get further restricted, i.e., its range can become more limited, namely if other nominal expressions are involved, or encountered, too. This is the case when there are two or three nominals expressed before there is a relational expression realized, as is regularly the case in verb-final constructions (cf. Kamide & Mitchell 1999, Bornkessel, Schlesewsky & Friederici 2003, Kamide, Scheepers & Altmann 2003). On the basis of the mutual affordances of the objects some circumstance between them is construed as a kind of prediction. For instance, when hearing the nominal expression *the boy*, the interpreter already, or incrementally, construes the boy as standing in some circumstance, however schematic, even before the finite verb follows. The verb, e.g., *runs*, then, either confirms the prediction, specifies it or proves it wrong; the latter would require reanalysis in the form of conceptualizing a circumstance anew. When hearing the nominal expression *der Junge* ('the boy') and then the expression *den Apfel* ('the apple') the mutual affordances between both objects are considerably fewer than the affordances of the boy and the apple in isolation, respectively, and on the basis of frequent prior experiences with similar object constellations the interpreter might predict, for instance, a relation of eating or throwing between the two objects. The affordances of the boy in isolation include rather unrelated circumstances like running, sleeping, falling, reddening, being smart, and so on.

In motivated mappings, NPs within PPs that are governed by verbs unambiguously constitute landmarks, i.e., mostly locations or objects at which something is located, towards or from which something moves. NPs governed by verbs and encountered first will be identified as trajectors (at least in languages with a predominant regular mapping outlined in the previous sections) that will be specified by a circumstance expression or by its relation to one or more other objects which then must function as landmarks, due to the logic of perception and spatio-temporal conceptualization.

Summing up, the "bare" construction together with the nominal expressions does not constitute meaningless symbols and strings of symbols. The construction and the nominal elements occurring in it interplay with each other in a way that allows predictions as to the nature of the circumstance that an utterance designates, however schematic.

The notions that make this possible are firstly trajector and landmark. They embody the asymmetry of objects in conceptualization. Utterances as instructions for conceptualizations

force an interpreter to treat each "incoming" nominal expression either as trajector or landmark.
Secondly, affordances play a central role. Depending on the state of the interpreter (pertinence, purposes, attitudes) and the object concepts referred to by nominal expressions (their frequent and/or pertinent features) these objects afford certain circumstances to the interpreter which enter his/her incremental interpretation in the form of predictions as to what circumstance will be predicated about the nominal expression in question. Affordances, especially with respect to causation, i.e., exertion of force, already interplay with trajector/landmark information. Objects that occur in a position in the syntactic structure where mostly and in the motivated case trajectors are realized (PSC) are associated with the exertion of force rather than with undergoing force (as long as their features allow this). Landmarks rather afford the latter. There is a simple reason for that: The syntactic structures outlined in the previous sections are diagrammatically iconic with respect to conceptualizations, which simulate perceptions, which show retinotopic mappings, where the retina takes up light waves from the environment. Figures in sensation are what are singled out against a ground because they are smaller and move. Now, the physical involvement of a figure precedes the exertion of force on the ground. The ground's undergoing exertion of force is therefore existentially dependent on and temporally later than the involvement of the figure. In motivated mappings which show diagrammatic iconicity, the first NP will therefore preferably be predicted to afford exertion of force and the other NP (in a syntactically transitive construction) will be predicted to undergo exertion of force.
This preference to make the first (ambiguous) NP the trajector and, if there is a second (ambiguous) NP, also the causer of the circumstance (which – if there is an agent – will also be the agent) conforms to what has been said about cognitive efficiency (as a balance between accuracy and economy) and the large-scale law of closure in section 3.2.1.4: If there is only one NP, this allows the interpreter to conceptually predict a simple monadic circumstance with a responsible, non-caused, animate trajector (or, one could say, agent). With this the concept is economically "closed" in terms of the large-scale law of closure. If the first NP was interpreted as some causally affected landmark (or, one could say, patient), in contrast, the concept of the circumstance remains "open" until an initiator of the whole circumstance is identified. Therefore a second NP might be required. At least conceptually some initiator would be required in order to "close" the concept. Therefore, such a prediction means additional cognitive load. (This topic will be picked up again in section 4.2.)
The third important notion is the number of objects involved. It influences the range of circumstances that an interpreter may predict to hold between objects. The crucial notion is mutual affordances here. The presence of two or three NPs in an utterance reduces the number of circumstances in which each NP in isolation could be predicted to stand.

4.1.3 The "bare" verb (plus preposition) (irrespective of inflectional morphology)

In an utterance the verb (plus preposition) actualizes one of the potentialities, i.e., affordances, of one or more objects because the speaker has conceptualized the respective object(s) to stand in this circumstance and wants his/her interlocutor to know this. Remember that in section 3.5 verbs have been characterized as hypostatizations, strictly speaking, because what

they designate manifests itself in nothing perceivable but the involved object(s). Now imagine an interpreter has made his/her conceptualizations including affordances on the basis of the string *hat Alex die Frau Matthias…* (lit. 'has Alex the woman Matthias…') and has not yet encountered a lexical verb. If the interpreter predicted on the basis of the object features and affordances, and maybe on the basis of his/her purposes that the circumstance between the three objects was that of showing and then actually encounters the verb *gezeigt* ('shown'), the bare verb has added nothing to his/her conceptualization. Even if the showing activity is not anticipated by the interpreter, the verb may only slightly modify his/her conceptualization in that the one showing is conceptualized as executing his showing activity relative to the other two objects. But the verb does not stand for something independent of the objects of Alex, the woman, and Matthias.

However, relative to the bare construction and the bare NPs, the bare verb may accomplish two things. Firstly, it picks out those (mutual) affordances that actually hold for some object(s). Where objects have been conceptualized beforehand by an interpreter on the basis of already encountered nominal expressions, this requires a re-conceptualization of these objects in most cases in terms of the circumstance that holds between them and which is expressed by the verb. Secondly, it might disambiguate, or concretize, the relationship between the involved objects with regard to the question what is trajector and what is landmark, where this is not definitively clear.

For instance, when hearing *dass die Frau das Mädchen…* (lit. 'that the woman the girl…'), a verb like *sehen* 'see' does not help determine which person is trajector and which is landmark because both relationships remain possible (both are similarly figure-apt, the NPs are ambiguous in case and identical in person information, and both NP orders are possible). The verb *adoptieren* 'adopt', however, would disambiguate this relationship in that the woman must be trajector and the girl must be landmark. With respect to incremental interpretation this potentially disambiguating aspect of the bare verb charges it functionally. The functional load of the verb is materialized in cognitively high interpretation "costs", when it actually disambiguates a circumstance towards a non-predicted interpretation (e.g., Bornkessel-Schlesewsky/Schlesewsky 2009a: 93).

If the verb is encountered first by the interpreter, it potentially allows predictions as to the features (e.g., those depicted in Figure 4.5 above) of the objects that are yet to come in the form of nominal expressions (in the terms of traditional subcategorization and selectional restrictions; cf. Altmann & Kamide 1999). However, the asymmetry remains between object concepts and circumstance concepts: The latter are literally nothing without the former. In order to conceptualize the circumstance expressed by a verb in a verb-first utterance, it is necessary to conceptualize the involved object(s) first, even if only predictively. In order to follow the instruction for simulating the perception underlying the verb *spielen* 'play' in an utterance that begins with *Spielt…* (potentially a rare declarative V1 structure, but most probably interrogative mood in the sense of 'does… play?') it is necessary to conceptualize some object first, "at" which playing may then manifest itself. It does not play a role here, whether the interpreter anticipates the concrete person that the speaker has planned to utter.

In motivated mappings, verbs designate the circumstances that hold for one or between two or three objects. Where applicable, a central aspect of circumstances are specifications as to locations, directions etc. For instance, any movement/motion "has" a manner and "goes" along a path. Most verbs of movement/motion code either manner or path (see section 3.3.5). Although there are different linguistic[o] strategies for coding such circumstances, e.g., incorporating paths into the verb stem (*enter* NP) or sourcing them out (*go into* NP), paths are always aspects of the circumstance. In contrast, the prepositional structure P+NP as a PP unit falsely suggests that paths conceptually make units with landmarks, insinuating a parallelism between syntax and conceptualization. This is misleading, as in the case of verbs and complements (cf. sec. 3.5).
Based on the considerations of sections 3.3 and 3.4, my claim is that any construction expressing a relation including a path conceptually (eventually among other aspects of the relation), is motivated only if it either expresses the path in the stem or is accompanied (by affixation or freely) by a preposition it governs. Consider (4.1a) and (4.1b).

(4.1a) *Peter malt Bäume auf die Mauer.*
Peter.3NOM paint.3 tree.ACC.PL on the.ACC wall
'Peter paints trees on the wall.'

(4.1b) *Peter bemalt die Mauer mit Bäumen.*
Peter.3NOM HOL-paint.3 the.ACC wall with tree.DAT.PL
'Peter paints the wall with trees.'

According to this rationale, *paint something on something* is motivated, whereas *paint something with something* is not because conceptually, painting is directed towards something and *with* does not express a path. The idea that there are prepositions "underlying" verbs and that these prepositions do not always "surface" as in the second instance of *paint* is not new (e.g., Gruber 1970, Fillmore 1968, Jackendoff 1972). That only "surfacing" (in contrast to incorporated) prepositions make a construction a motivated one naturally follows from the utterance-as-instruction-for-simulating-perceptions view and from the assumption of diagrammatic iconicity between conceptualizations and constructions. There are several such alternations as in (4.1), e.g., the locative alternation (*load sth. with sth.* vs. *load sth. on sth.*), the conative alternation (*hit sth.* vs. *hit at sth.*), and the dative alternation (*give s.o. sth.* vs. *give sth. to s.o.*) (see section 4.4). The variants in which there is no path expression there are instances of compression: A syntactic unit compresses what is conceptually uncompressed. For instance, conceptualizing *paint sth.* requires conceptualizing the directedness of painting in terms of a path, which remains implicit. Modelled on Figure 3.40 from section 3.3.7, Figure 4.6 illustrates this.

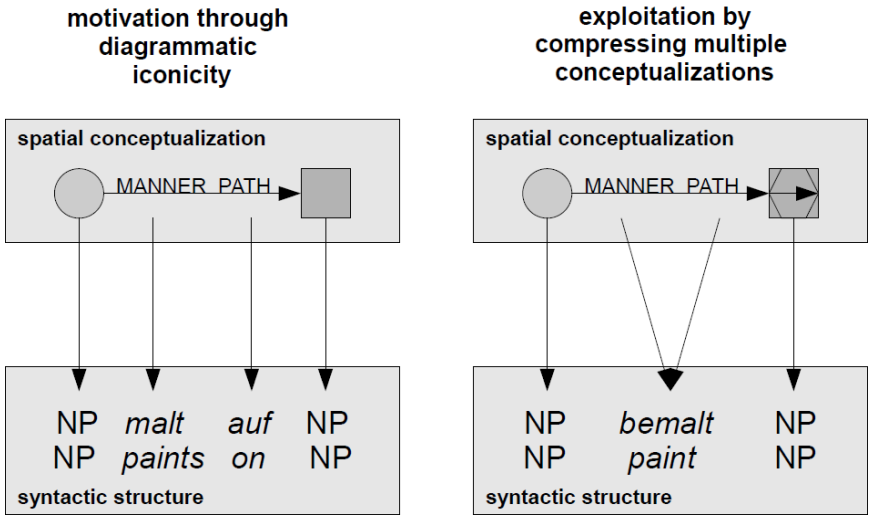


Figure 4.6: "Underlying" and "surfacing" prepositions

The fact that specific syntactic minimal pairs like *Peter malt Bäume auf die Mauer* 'Peter paints trees on(to) the wall' and *Peter bemalt die Mauer mit Bäumen* 'Peter paints the wall with trees' need not be interpreted identically does not alter the motivation-compression analysis.[166] In particular, many theoreticians argue that in the construction with the direct object the associated entity (concept) is "more strongly" or "holistically affected" by the circumstance described by the verb (for an overview cf. Levin & Rappaport Hovav 2005: 208ff.). "More strongly" and "holistically" is mostly intended to mean something like 'undergoes greater change of state' or 'undergoes change of state with its whole physical body', respectively. In the above example this would be constituted by the wall's being covered with tree paintings to a greater extent or even completely in the NP-V-NP construction than in the NP-V-P-NP construction. These matters were already discussed in section 3.3.7. However, it is interesting to ask where the supposed holistic meaning of the NP-V-NP construction comes from, i.e., whether it is a property of the direct object position. From the view taken here such an assumption must be rejected. As indicated in Figure 4.6 above, the utterance *Peter bemalt die Mauer mit Bäumen* exploits the regular, i.e., motivated mapping in that there are aspects of the circumstance compressed in the verb which are conceptually uncompressed. It might be an interesting strategy to ask what the construction underlying the utterance in (4.1b) with the holistic interpretation and the exploiting structure would look like, if it were motivated and therefore distinct from (4.1a) which suggests the location landmark interpretation. One would take the motivated instance from (4.1a) with the structure NP-V-P-NP and provide it with an (in the first instance hypothetical) distinct preposition **bi* meaning something like 'directed at x, embracing it as a whole', as in (4.1c). The asterisk marks a hypothetical or reconstructed form here.

(4.1c) *Peter malt Bäume *bi die Mauer.*
'Peter paints trees on the wall, embracing it as a whole.'

[166] Only (4.1b) suggests a reading where the wall is entirely covered by tree paintings. Though, *the wall* can also be interpreted as the location to which tree paintings are applied, with no aspectual or degree-of-affectedness specification, which is the default interpretation for (4.1a).

In fact, **bi* is supposed to be a West-Germanic preposition (Kluge [24]2004) and is a documented Gothic preposition that has disappeared in German and English and can be paraphrased, among other things, with 'directed at around x'.[167] It is easy to see how a holistic interpretation can be traced to the meaning of **bi* which is preserved in the New High German prefix particle *be-*. Grimm (1826: 798) states that what *be-* expresses is poly- or omnidirectional impact and full completion[168] which is exactly what some modern theoreticians ascribe to the direct object position in general. Wilmanns ([2]1899: 134) emphasizes that "this use [of the particle] which makes it especially suitable for transitive use could easily develop from the meaning 'around, over [*über... hin*; SK]'. Consequently, transitive verbs are formed with *be-* with particular frequency."

Similar things could be said about other particle verbs in German with prefixes like *ver-* (Goth. *faur*, *fra-*, *fair-* 'before, for, away', *zer-* ('separation')[169]), *ent-* (Goth. *and-* 'against'), *er-* (Goth. *us* 'away from sth.', esp. 'from inside to ouside, up from below'), and *ge-* (goth. *ga-*, 'x-ing together', i.e., collective meaning (cf. Wilmanns [2]1899, Kluge [24]2004)).

Diachronically, we can detect a development from motivation towards exploitation by compression: Conceptual paths that once were expressed by means of prepositions are prefixed to verbs and gradually become ever less recognizable as expressions for paths. For instance, German *be-* has almost entirely lost its spatial meaning component (lost in *bewahren* 'conserve', preserved in *belügen* 'lie (at s.o.)'), similarly German comitative/collective *ge-* (lost in *gewinnen* 'win', preserved in *gerinnen* 'curdle') or English *be- (begin, bewilder)*. This does not alter the fact, however, that conceptualizing utterances like (4.1b) requires conceptualizing paths. On the other hand, it means shifting quite a part of a grammar towards exploitation, if the grammaticalization of a preposition is carried through systematically (and at the same time leaving the potentially holistic conceptualization of the landmark untouched). Where this happens, it results in a whole new type of conceptualization associated with the NP_{nom}-V-NP_{acc} (*Jmd. bemalt etwas*, 's.o. paints sth.') construction, making it more homonymous. Originally, this construction diagrammatically reflected dyadic relations the conceptualizations of which do not include paths, e.g. *John learns (*at/*by/*from/*to/*with/*etc.) a poem*. Because of this I deem it inappropriate to associate the direct object, or its syntactic position, with a holistic reading. This reading is possible where the construction compresses a conceptual path into the verb lexeme by exploitation because the nature of the path within the circumstance determines the holistic reading, and not a formal syntactic feature.[170] It is therefore unreasonable to talk of *per se* holistic direct objects where there are no conceptual paths there for which the objects are means of coding.

[167] In particular, Wilmanns ([2]1899: 134) specifies that **bi* governed the accusative in older times indicating direction. As primary meaning he mentions New High German *um, herum*. I have condensed these data into 'directed at around x'.

[168] "[E]s liegt in dem be- die viel- oder allseitige einwirkung, die ganze und volle bewältigung."

[169] Presumably, NHG *zer-* is historically related to the numeral *two*, from which comparison and intensifying (e.g., Goth. *dishaban* 'to catch + intens.') as well as separation (e.g., Goth. *disdailjan*, NHG *zerteilen* 'to part sth.') are easily deducible.

[170] Strictly speaking, talking about "the nature of the path" is imprecise. It would be more appropriate to call it the spatial distribution of the object which is the trajector of the circumstance in question. In particular, the "nature of the path" in 'painting trees on the wall, embracing it as a whole' is determined by the distribution of the paint in the form of trees on the wall.

In the light of verbs which code but do not compress paths in the verb stem, as in the case of *enter*, it is not reasonable to talk of a priori holistic objects, either.
Apart from that, one would expect advantages in processing for the utterances with motivated mappings underlying them. With respect to the so-called locative alternation (as in 4.1a) and (b) utterances with the structure given in (4.1a) indeed seem to be assessed faster with regard to their acceptability than utterances with structures like (4.1b) (cf. Christensen & Wallentin 2011). From the perspective taken here this can be explained by the necessity to "de-compress" the conceptualizations conflated in the (b) structure (i.e., in the verb), whereas this is not necessary in the case of (a).

4.1.4 Agreement morphology

The formal correlates of the spatio-temporal layout of a circumstance, the objects involved in the circumstance including their (mutual) affordances, and the circumstance itself which actualizes one of the (mutual) affordances – in other words, the construction, the complement(s), and the verb might be all that is necessary to simulate some circumstance concept from an utterance. However, these formal constituents do not yet suffice to make all possible conceptualizations (plus attributions) efficiently sharable between interlocutors in a language. Without further formal restrictions too many ambiguous utterances remain, i.e., too many possible conceptualizations. The aforementioned notions in any case allow building up some conceptualization of a circumstance predictively, because they provide an interpreter with the respective concepts. They do not suffice in too many cases, however, to definitively fix the trajector/landmark distribution (which is PSC?) in a circumstance. When the referents of the two or three complements in a specific utterance have roughly similar affordances, there are two or six possible distributions of trajector and landmark, respectively.

Therefore, most if not all languages employ further formal means to make sure that the conceptualizations of interlocutors are sufficiently similar to each other to warrant (the illusion of) mutual understanding. One of these means is morphological markers.

This section deals with the agreement between verb and complement with respect to the specification of which object concept functions as trajector or landmark in the circumstance in question. From the utterance-as-instruction perspective of Instruction Grammar, morphological agreement information on the verb and some NP (as well as case markers on NPs) are helpful but strictly speaking hypostatizations: Agreement information on the verb and on an NP are from a conceptual perspective not independent of the object in the circumstance concept (which in turn is not independent of the objects involved).

Conceptually, an object or several objects in a circumstance have as little number specifications as the circumstance itself has. In a circumstance concept a circumstance simply is what it is, and the roles of the objects are what they are. That does not mean that agreement markers are not motivated. They are concessions to the symbol system that forces into linear distribution what is actually synchronous and undistributed.

In section 3.3 I have illustrated that there are verbs that have trajectors (e.g., *sell*) and verbs that have landmarks (e.g., *buy*) as their PSCs. If the interpreter knows which lexicalization is conventionalized in which verb, agreement markers can determine which object concept functions as trajector or landmark of the circumstance expressed by the verb in the incremental interpretation of an actual utterance. Mainly two factors govern the functional charge of formal agreement information. This is firstly the question of whether agreement information is unambiguous at all. In (4.2a) agreement is not unambiguous and therefore cannot contribute to guaranteeing shared conceptualizations among interlocutors like an utterance with unambiguous agreement morphology. In (4.2b) it is unambiguous and it is therefore the only formal means to definitely fix the trajector/landmark distribution in this structure. It is therefore functionally charged.

(4.2a) ... *dass die Frau* *das Mädchen* *sieht*.
that the woman.3SG.NOM/ACC the girl.3SG.NOM/ACC see.3SG
'… that the woman/the girl sees the girl/the woman.'

(4.2b) ... *dass die Frauen* *das Mädchen* *sehen*.
that the women.3PL.NOM/ACC the girl.3SG.NOM/ACC see.3PL
'… that you see the girl/*that the girl sees you.'

Secondly, agreement information may be unambiguous as in (4.2b), but need nonetheless not be informative, namely when the trajector/landmark distribution has already been fixed by means of other information available to the interpreter (cf. Bates et al. 1982, MacWhinney et al. 1984, MacWhinney 1987). In (4.3a) it is the affordances of the cakes which exclude the possibility that they are the trajector in the baking circumstance, even before the auxiliary *hat* 'has' is uttered which agrees with the pronoun *sie* 'she' in number, making it trajector and PSC in the construction. That means the interpreter already knows the appropriate trajector/landmark distribution when encountering *gebacken* 'baked'.

(4.3a) ... *dass sie* *die Torten* *gebacken* *hat.*
that she.3SG.NOM/ACC the cake.3PL.NOM/ACC bake.PTCP have.3SG
'… that she baked the cakes.'

(4.3b) ... *dass sie* *die Torten* *im Gesicht getroffen haben*.
that her.3SG/PL.NOM/ACC the cake.3PL.NOM/ACC in.the face hit.PTCP have.3SG
'… that the cakes hit her in the face.'

In (4.3b) the trajector/landmark and PSC distribution is (almost[171]) disambiguated by the information about the face which must be a feature specification of the referent of *sie* 'she/her' and by the infinite verb *getroffen* 'hit'. By the feature specification *sie* can be

[171] It remains possible that a verb like *abgewaschen hat* 'washed off' makes the referent of the pronoun the trajector and privileged syntactic complement, and the cakes that are in her face ([$_{NP}$ the cakes in her face]) the landmark.

identified as a person whose face is the landmark of flying cakes (flying being an affordance of cakes but less probably of the person).

4.1.5 Phrase order

Up to this point, phrase order has played a minimal role, and then even indirectly: In section 3.3.2 it has been illustrated that there are verbs whose PSC is a trajector and verbs whose privileged syntactic complement is a landmark. Both strategies are motivated because they are diagrammatically iconic with respect to how the circumstance has unfolded conceptually or to how a circumstance concept is "scanned", respectively. Privileged syntactic complement/landmark mappings are possible and PSC/landmark-oblique object/trajector structures are thus to a certain degree expected. However, when there is no unambiguous agreement information, the PSC eventually cannot be definitively fixed. We are then back at the point where an interpreter has all "participant" concepts for conceptualizing a circumstance at his/her disposal and agreement markers but nonetheless cannot fix the trajector/landmark and PSC distribution, as in (4.2a) which is repeated here.

(4.2a) ... *dass die Frau* *das Mädchen* *sieht*.
that the woman.3SG.NOM/ACC the girl.3SG.NOM/ACC see.3SG
'… that the woman/the girl sees the girl/the woman.'

This is where phrase order may come into play. The functions of arranging complement phrases in different possible orders are manifold. In languages where different orderings are possible the influence of information structure cannot be overestimated (cf. van Valin & LaPolla 1997). Here, we are interested only in the contribution of phrase order to sufficiently similar conceptualizations. By phrase order not only the actual order of formal constituents in particular utterances is meant (local order) but also the phrase order freedom or rigidity that a language generally exhibits in this respect (global order). In the previous sections some examples of grammatical object-before-PSC orders have been used. The global order of complements in German is often claimed to be free (e.g., Müller 1999). Accounting for certain restrictions in spoken language and varieties of German (e.g., New Low German dialects), this statement will be accommodated to "relatively free". (In addition, there is some consensus that in general the first ambiguous NP in a German sentence is by default interpreted as the PSC of that sentence ("subject preference"; Schlesewsky et al. 2000). This will be more extensively discussed in section 4.2.1.)

Now, the problem with (4.2a) – namely that it remains ambiguous despite the information supplied by the formal constituents discussed so far – lies exactly in the globally relatively free phrase order in German. When we take a look at English we see that phrase order accomplishes the disambiguation of the trajector/landmark and PSC distribution. In contrast to German, English phrase order is functionally highly charged in that it is a strong cue in determining the trajector/landmark and PSC distribution. Consequently, it can "afford" marginal agreement markers in its verbal paradigms.

(4.2c) ... *that the woman sees the girl*.

‘woman = seer’; *’girl = seer’

Together with the knowledge about whether a verb has a trajector or landmark as PSC, phrase order in English almost definitively fixes the nature of the circumstance, thus providing an eminently efficient system for enabling simulated perceptions by taking utterances as instructions. On the other hand, it exhibits less information-structurally induced flexibility in phrase order than many other languages.
In previous sections, formal units that have no counterparts in conceptualization *stricto sensu* have been characterized as hypostatizations, namely verbs and agreement markers. These notions are concessions to the linearity into which languages force signs for concepts. What is the status of phrase order in this respect? This question will be answered using the example of the following two sentence pairs, and anticipating aspects of the subsequent section.

(4.4a) *Ich habe die Mona Lisa*.
I.1SG.NOM have.1SG the Mona Lisa.3SG.NOM/ACC
‘I have the Mona Lisa.’

(4.4b) *Die Mona Lisa habe ich*.
the Mona Lisa.3SG.NOM/ACC have.1SG I.1SG.NOM
‘I have the Mona Lisa’/‘The Mona Lisa I have.’

(4.4c) *Ich bin in den Louvre gegangen*.
I.1SG.NOM be.1SG.PRES in the Louvre.ACC go.PTCP
‘I went into the Louvre’

(4.4d) *In den Louvre bin ich gegangen*.
in the Louvre.ACC be.1SG.PRES I.1SG.NOM go.PTCP
‘I went into the Louvre’/‘Into the Louvre I went.’

Have is a verb whose PSC is a landmark. A German PSC always bears nominative case. The landmark-to-PSC mapping is a regular and in a sense motivated mapping between conceptualization and syntax. However, it is presumably dispreferred as well as cognitively disadvantaged to and less frequent than the mapping of the trajector to the PSC, the landmark to an oblique object, and the circumstance to a verb (plus preposition) (see section 3.3.2). Although (4.4b) does not allow realizing the trajector as PSC of *have*, it does allow building up a conceptualization starting with the trajector – bearing accusative case – in almost the same manner as in a construction with the regular mapping. An oblique object-before-PSC order can thus be characterized as motivated in that it establishes a diagrammatically iconic conceptualization just like the regular mapping with a trajector PSC does, and it does so by phrase order. The reverse case is given in (4.4c) and (4.4d). The former allows for a diagrammatically iconic incremental conceptualization. This is not possible in the latter sentence.

Thus, phrase order stands in a contingent relationship with the motivation of diagrammatically iconic structures, at least in German.

4.1.6 Case morphology

The distribution of trajector and landmark and the PSC for (4.2a) is not yet definitively fixed, despite there being agreement morphology and a definitive phrase order. Unfortunately, both have insufficient interpretive value. Agreement morphology has insufficient interpretive value locally, i.e., in this sentence. Phrase order has insufficient interpretive value globally, i.e., in the Standard German variety. (Matters might be different in non-Standard varieties.) The last formal unit discussed here that could disambiguate (4.2a) and similar structures is case morphology. Combining Blake (^{2}2001) and Dürscheid (1999) I distinguish case categories, case forms/markers and case bearers. Case categories (e.g., nominative, genitive, dative, accusative, ablative) can be abstracted from the distributional pattern of case forms (e.g., *-us*, *-i*, *-o*, *-um*, *-o*) that attach to case bearers (e.g., *domin-* 'master') in a language (e.g., Latin). If there is no distribution of different case forms, there is no case category, or simply case, in that language, or alternatively, there is only a single case with a zero case marker. Thus defined, case is a formal unit in the first instance.

4.1.6.1 Case in general

Generally and trivially, the motivation for using distinct linguistic^{o} symbols in distinct circumstances is coding distinct conceptualizations (and, eventually, attributions). This includes uttering *animal* instead of *dog* (see section 3.2.1) and it can include using a dative instead of an accusative case form. The use of *animal* instead of *dog* may be motivated by the pertinence of the referent object in the situation of the utterance. The features that make the object a dog may simply not be pertinent. By what differentiations is the use of a case form motivated? Three subquestions will be discussed:

(i) What is the domain of the differentiations case forms accomplish?

a) the local domain: the differentiation that a case form accomplishes concerns the actual construction underlying an utterance;

b) the global, general domain: the differentiation that a case form accomplishes concerns any possible construction underlying an utterance of the language in which this form occurs;

c) the global, specific domain: the differentiation that a case form accomplishes concerns only instances of some particular linguistic^{o} unit of the language in which this form occurs;

(ii) Are cases associated with particular differentiations? If yes, which differentiations?

a) particular differentiations or not?

b) differentiations of what kind?

(iii) Can other formal units accomplish the same differentiations? If yes, why is there case?

(i) Imagine some case form *-x* in some actual utterance differentiates some semantic unit A from another semantic unit B such that *-x* signals A. Is this differentiation restricted to this utterance (= question (i (a)))? In one sense the answer is yes, in a more important sense it is no. The case form *der*, indicating nominative case, is attached to *Poet* 'poet' in (4.5) and to *Chaot* 'careless person, slob' in (4.6), respectively. The nominative is supposed to have some distinctive value. The question is whether the nominative differentiates *Poet* from *Chaot* in (4.5) and *Chaot* from *Poet* in (4.6), respectively, or whether it differentiates *Poet* from *Chaot* and *Chaot* from *Poet* between (4.5) and (4.6) and between (4.6) and (4.5), respectively.

(4.5) *Der Poet schreibt dem Chaoten.*
the poet.3SGNOM write.3SG the slob.3SGDAT
'The poet writes (to) the slob.'

(4.6) *Der Chaot schreibt dem Poeten.*
the slob.3SGNOM write.3SG the poet.3SGDAT
'The Chaot writes (to) the poet.'

It is easy to see that the two instances of *der* are interchangeable without altering the conceptualization of one of the sentences. What differentiates the poet from the slob are their respective features, but not the nominative form of the determiner, and therefore not the nominative, and therefore not case. When substituting the nominative marking from (4.5) and the dative marking from (4.6) (consisting of *dem* and *-en*) and the other way around, the conceptualization of the new (4.5) sentence becomes that of the actual (4.6) sentence and the other way around. What these latter substitutions do not do is alter the identity of the poet and slob, respectively, but only their kind of involvement in the circumstance designated by the verb, namely their states as either trajector or landmark, respectively. In order to accomplish this, case must interplay with agreement in that it must be clear that a particular case form is associated with the verbal agreement marker such that the trajector/landmark distribution in the circumstance in question becomes clear.
Thus, the case form *der* in (4.5) differentiates it from the other case form (*dem… -en*) in the same utterance in relation to the circumstance. And it does so similarly in (4.6).

For the underlying construction NP_{nom}-V-NP_{acc} we can therefore generalize that the differentiation a case form accomplishes concerns the actual construction underlying an utterance. In this sense question (i (a)) can be affirmed.

At the same time it simplifies matters. Consider (4.7a) to (c).

(4.7a) *Der Papst stellt dem Kardinal den Novizen vor.*
the pope.3SGNOM introduce.3SG the cardinal.DAT the neophyte.ACC PART
'The pope introduces the neophyte to the cardinal.'

(4.7b) *Der Kardinal stellt dem Novizen den Papst vor.*
the cardinal.3SGNOM introduce.3SG the neophyte.DAT the pope.ACC PART
'The cardinal introduces the pope to the neophyte.'

(4.7c) *Der Novize stellt dem Papst den Kardinal vor.*
the neophyte.3SGNOM introduce.3SG the pope.DAT the cardinal.ACC PART
'The neophyte introduces the cardinal to the pope.'

Obviously, what works for (4.5) and the NP_{nom}-V-NP_{dat} construction in general also works for the NP_{nom}-V-NP_{dat}-NP_{acc} construction: The case form of *der* differentiates the kind of involvement of the case bearer from the case forms of the other case bearers in relation to the circumstance expressed by the verb. The same is true for *dem* and *den*, respectively. Generalizing this, we can state that this principle works for any construction in a language. In the present context this concerns those constructions listed in sections 3.3.9 (Table 3.8) and 4.1.1 (Table 4.1).

A consequence is that (i (a)) can be affirmed because (i (b)) can: The differentiation that a case form accomplishes applies to the construction that underlies an utterance, and this holds for each and every utterance in a language, i.e., for the global, general domain.

It can be shown, however that the affirmation of (i (b)) is also a simplification, namely when we take the exact nature of the differentiation into account. Compare (4.8a) and (b).

(4.8a) *Der Bär* verb-*t.*
the.3SG.NOM bear.SG verb-3SG
'The bear verbs.'

(4.8b) *Der Bär* verb-*t die Fischgräten gegen*
the.3SG.NOM bear.SG verb-3SG the.3PL.ACC fishbone.PL against
den Baumstamm.
the.3SG.ACC treetrunk.SG
'The bear verbs the fishbones against the treetrunk.'

We are still dealing with the question of how interlocutors arrive at sufficiently similar conceptualizations (and attributions) based on an utterance. Having taken the perspective of the interpreter, the contributions of most formal means have been clarified. In particular, it has been shown that the "bare" construction and the "bare" (P plus) NPs play an especially important role. On the basis of the construction and the nature of the NPs (governed by V vs. governed by P) it is to a certain degree possible to predict, or anticipate, the nature of the circumstance that holds between the NP referents. Of central importance was – besides the identification of the trajector/landmark distribution in a circumstance – the fact that single objects afford circumstances but that the presence of multiple objects reduces what each

object affords because the objects in combination exhibit mutual affordances which are a subset of the affordances of an isolated object.

Now, if a case form in an utterance and in its underlying construction differentiates the semantics of the respective case bearer from those of the bearers of the other case forms (if there are any) in exactly the aforementioned respects (single and mutual affordances depending on the construction and the nature and number of NPs), then it is clear that a case form in one construction cannot accomplish the differentiations that the same case form accomplishes in another construction.

Accordingly, the nominative case form in (4.8a) differentiates the semantics of its case bearer from nothing whatsoever. As a consequence, its semantic range is close to maximal (cf. Frisch & Schlesewsky 2005 for a similar argument) – restricted not by case but by the features of the case bearer. This is schematically depicted in Figure 4.7, once more repeated from an earlier section, with only a slight modification.

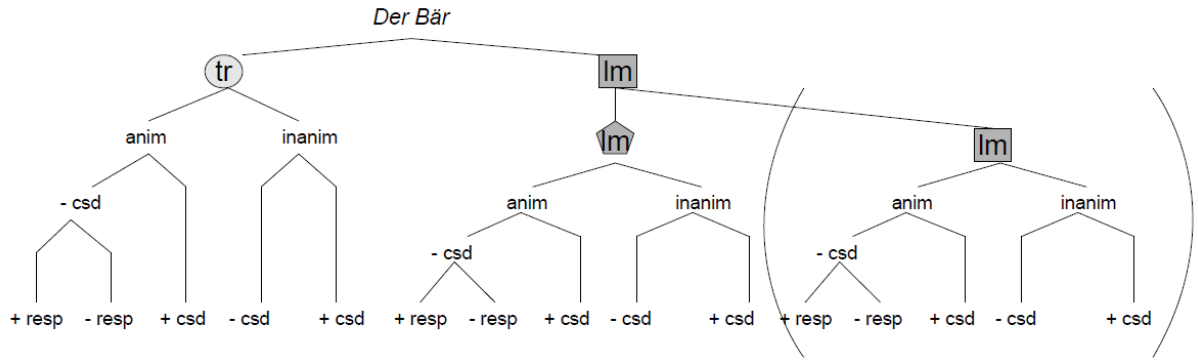


Figure 4.7: Semantic range of Der Bär *'the bear' in [$_{NP}$ bear]-V construction*

The location landmark branch is put in parentheses because corresponding utterances are almost but not completely excluded (?*Der Bär läuft aus* 'The bear leaks', e.g., after having been shot). In contrast, the nature of what the nominative (form) in (4.8b) differentiates is different in that the co-occurring NP referents of the construction reduce the number of the affordances of the nominative case bearer considerably, forcing it – as far as I can see – into the trajector function. This is depicted in Figure 4.8.

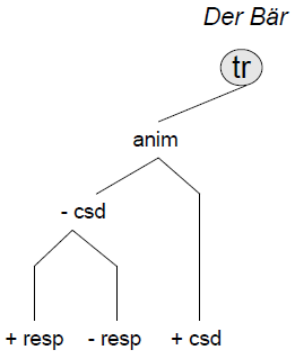


Figure 4.8: Semantic range of Der Bär *'the bear' in [$_{NP}$ bear]-V-[$_{NP}$ fishbones] [$_{P}$ against] [$_{NP}$ treetrunk] construction*

These sentences are instances of two of the most important constructions in German that are listed in section 4.1 above. However, as *Der Bär läuft aus* 'The bear leaks' (bear landmark) and *Der Bär rennt* 'The bear runs' (bear trajector) illustrate, constructions may exhibit homonymy. That means that while case forms in principle accomplish differentiations within their utterances and constructions, respectively, the nature of the differentiations cannot be characterized as similar or identical.
Further above, (i (b)) has been affirmed in stating that the differentiation a case form accomplishes concerns any possible construction underlying an utterance of the language in which this form occurs.

We can now constrain this statement further by factoring in the nature of the differentiation the case form accomplishes, thereby affirming (i (c)): The nature of the differentiation that a case form accomplishes concerns only instances of the construction of the language in which this form occurs. This is the global, specific domain. Thus, case has value for each utterance, across all utterance types, and especially within each construction.

Question (ii (a)) (Are cases associated with particular differentiations?) can be answered rather briefly. It follows from (i (c)) that within constructions, cases can code particular differentiations (e.g., those depicted in Figures 4.7 and 4.8 above, respectively). But following up on earlier statements on variation within single constructions (see section 3.3.9), constructions are not as homogenous as the above examples suggest. Independently of the questions concerning trajector/landmark distribution, affordances, mutual affordances, nature of NPs, agreement, case, and so on, constructions show internal variability with respect to the question of whether

- they code a circumstance in a motivated or exploiting manner,
- they code egocentric or allocentric space,
- they code states or telic/atelic processes and activities.

These first two factors add a considerable portion of variability and – in the case of the third factor – even homonymy to each construction. Nevertheless, I have tried to illustrate that constructions play a central role in how conceptualizations can be build up in incremental interpretation and how the information they provide can advance mutual understanding. It seems likely that the notion of construction also serves the learnability of languages for the reasons outlined here.

That means, with certain important restrictions (ii (a)) can be affirmed.

This leads directly to question (ii (b)) (Of what kind are the differentiations?). It will be shown, that my thesis regarding this question is of paramount importance for the syntax/semantics relationship as a whole. In particular, what I believe is that there is no basic construction in which a case form (or some other formal constituent) makes a differentiation with respect to attribution.

That means there is no basic construction in which case codes the attribution of responsibility for some circumstance. One could say, case is blind to the whole actional grounding of the linking competence (i.e., attribution). Where responsibility on the side of an object is coded unambiguously in an utterance and need not be attributed additionally (where this is possible at all), this is enforced either by a lexical form (e.g., a verb like *murder* in contrast to *kill*; cf. van Valin/Wilkins 1996) or it is indicated by a non-basic construction. Basic are those constructions that exhibit a motivated, i.e., diagrammatically iconic mapping of the type exemplified by Figure 4.9, counting as representative of all constructions listed in Table 4.1 above.

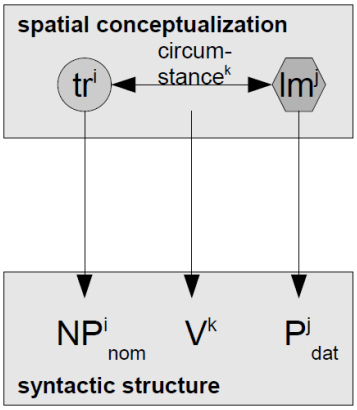


Figure 4.9: A basic construction

Non-basic are therefore mainly constructions like the passive construction (diathesis) or the imperative construction.[172] They are non-basic because they deviate from the abovementioned motivated mapping by ceding competing motivations: discourse/information structure in the passive and illocutionary force in the imperative construction. The deviation from the motivated, regular mapping is presumably correlative with the age of these constructions: They are historically younger, even across language families (cf. Wilmanns 1906: 134ff. for German; Givón 2009 for a more global perspective), and are instances of grammaticalization, i.e., conventionalization (e.g., Fleischer & Schallert 2011 for German). The younger age of the passive is also indicated either by its periphrastic character and the fewer number of distinct verb forms or by its morphological markedness in relation to the active. Data from the "World Atlas of Language Structures (WALS)" (Dryer & Haspelmath 2011) point to the existence of implicational hierarchies, or the secondary status of these constructions at least, such that when there is a passive or an imperative construction in the sense outlined in fn. 172, then there is also an active construction and an indicative construction, respectively (cf. Siewierska 2011, van der Auwera et al. 2011; see also Keenan & Dryer ^{2}2007, Givón 2009).

[172] The passive construction is qualified by the following features:

> "i. it contrasts with another constuction, the active; ii. the subject of the active corresponds to a non-obligatory oblique phrase of the passive or is not overtly expressed; iii. the subject of the passive, if there is one, corresponds to the direct object of the active; iv. the construction is pragmatically restricted relative to the active; v. the construction displays some special morphological marking of the verb." (Siewierska 2011).

The imperative is characterized by having "second person singular [or] plural imperatives as dedicated morphological categories." (van der Auwera et al. 2011). Often, reduction of valency by one is another indicator of imperative mood, and hence the imperative construction.

The tendency "away from diagrammatically iconic motivation towards grammaticalization" works similar to what has been demonstrated about the *malen-bemalen* 'paint-paint' alternation in section 4.1.3.
Interestingly, these constructions are not (yet?) as extensively exploitable as the basic constructions. Respective examples have been given in another context already (see section 3.3.3.2); they are repeated here as (4.9a) and (b), and as (4.10a) and (b).

(4.9a) *Der gestrige Tag hat wieder viele Stürze von Fahrern gesehen.*
The last day has again many accidents of cyclists seen
'The last day has again seen accidents of many cyclists.'

(4.9b) #*Viele Unfälle von Fahrern sind vom gestrigen Tag gesehen worden.*
Many accidents of cyclists are by-the last day seen were
'Many accidents of cyclists were seen by the last day.'

(4.10a) *Der Priester hat viele Jungen gesehen.*
The priest has many boys seen
'The priest saw many boys.'

(4.10b) *Viele Jungen sind vom Priester gesehen worden.*
Many boys are by-the priest seen were
'Many boys were seen by the priest.'

The non-basic constructions, exemplified by the (b) variants can code fewer semantic differentiations than their basic constructional counterparts, respectively. They have a smaller semantic range. The restrictions on imperatives are even stronger.

(4.11a) *Du erschießt den Bären.*
'You shoot the bear.'

(4.11b) *Erschieße den Bären nicht.*
lit. 'Shoot the bear not.'; 'Don't shoot the bear.'

(4.12a) *Du magst Alex nicht.*
lit. 'You like Alex not.'; 'You don't like Alex.'

(4.13b) #*Möge Alex nicht.*
lit. 'Like Alex not.'; 'Don't like Alex.'

This leads to the situation that the imperative is – as a grammatical, not just a lexical means – reserved for coding responsibility. And the passive, to a lower (and decreasing?) degree, too:

(4.14a) *Peter hat sein Schicksal beim Essen gefunden. Ein Donut hat ihn getötet, indem er daran erstickt ist.*

'Peter found his fate in food. A donut killed him, as Peter choked on it.'

(4.14b) *Peter hat sein Schicksal beim Essen gefunden. [?Er ist von einem Donut getötet worden], indem er daran erstickt ist.*
'Peter found his fate in food. He was killed by a donut, as Peter choked on it.'

The second matrix sentence in (4.14b) sounds odd, when the donut is not conceived of as anthropomorphic – having arms, moving like a human, getting himself stuck in Peter's trachea.
The tendency seems to be that the more basic a construction is the fewer the semantic restrictions on it. The (a) sentences are instances of basic constructions. Their PSCs are always semantically unmarked with respect to the responsibility status of their trajectors, respectively. The (b) sentences are non-basic. Their trajectors are preferably attributed responsibility. Sometimes, not making these attributions even results in non-acceptability of the respective utterances.
If this is true, it is additional evidence for the "imposition" thesis defended in sections 3.2 and 3.4: Basic, motivated constructions do not code actional, i.e., attributional, matters. They must be inferred by means of impositions onto spatio-temporal cores of conceptualizations. As formal means, attributional matters enter utterances only via lexical material and non-basic constructions.

Question (ii (b)) can therefore be answered as follows: The nature of the differentiations determined by case is restricted by these differentiation having a perceptual basis. Cases differentiate spatio-temporal concepts from one another. In contrast, their differentiations are completely indifferent to actional matters.

That does not mean that in particular utterances some case bearer is not preferably attributed responsibility. It means that a case bearer in basic constructions is never necessarily attributed responsibility, while a case bearer is always necessarily identified/categorized as trajector or landmark, as object or location, as being caused or uncaused, and so on.
Question (iii) (Can other formal units accomplish the same differentiations? If yes, why is there case?) asks for the relationship of case morphology to the other formal constituents discussed above. It has been demonstrated that primarily, case morphology helps determine the trajector/landmark distribution in the conceptualization of an utterance. Ultimately, it shall help build up a more precise concept of a circumstance such that the interpreter has a glimpse of what stands in what spatio-temporal circumstance with what so that this sufficiently corresponds to the speaker's conceptualization.[173] However, it cannot accomplish this without a complex interplay with agreement and phrase order information, each of which accomplish

[173] This can of course never be clarified linguistically^{o}, at least. It has been argued in the introduction to chapter 4 that conceptualizations built up from utterances can never be identical between two interlocutors. If one (or better: two) wanted to be sure that their conceptualizations were sufficiently similar, and they negotiated it linguistically^{o}, they would find themselves in an infinite semiosis: For their negotiating utterances the same is true as for their original utterance. They cannot be sure that they conceptualize them similarly/identically to each other and would have to negotiate that again and again *ad infinitum*.

similar differentiations. (The contributions of "bare" constructions, nouns, and/or verbs are invariably the same for all languages.)

As to (ii (b)), the picture is thus that there are different means for accomplishing similar differentiations. Each of the formal constituents in isolation often does not suffice to accomplish them. In combination they do, potentially even redundantly.

By way of example, if a language (e.g., Classic Latin) has unambiguous case morphology and unambiguous and unique agreement morphology, it may "afford" free phrase order. Case and agreement (together with the invariable constituents) accomplish anything necessary for conceptualization. If a language has neither unambiguous case morphology nor unambiguous and unique agreement morphology, only a strict phrase order can avoid a general, global ambiguity (English comes close to this pattern). In addition, it must be conventionalized that the trajector/landmark distribution of the verb is also determined by phrase order. Redundant patterns employ unambiguous morphology and (relatively) fixed phrase order (Icelandic comes close to this pattern). Underspecified patterns show poor morphology and (relatively) free phrase order (Bulgarian comes close to this pattern).
Thus, one finds each of these patterns in the world's languages. The redundant ones are not the problem (since we are not dealing here with economy matters primarily), but the underspecified ones: How do interlocutors arrive at sufficiently similar conceptualizations when confronted with such structures/languages? This will be the topic of section 4.2.
I have discussed the contributions of phrase order, agreement morphology, and case morphology to shared conceptualizations of circumstances in a rather general way now. Since the present work is primarily concerned with German, and because its case system has often gained special attention, the next section deals with the German dative, by means of a case study.

4.1.6.2 Case study: the German dative

In the previous section I have demonstrated that the differentiation a case form accomplishes applies to the construction that underlies an utterance, and that this holds for each and every utterance in a language (see (i (a)) in the previous section). This observation is only half of the truth, because it does not take the nature of the differentiation into account: Case forms also accomplish specific differentiations, but only in dependence of their occurrence in particular constructions (see (i (b) and (c)) in the previous section). This is true, although particular constructions may exhibit considerable homonymy, especially monadic NP_{nom}-V and dyadic NP_{nom}-V-NP_{acc} constructions. I think the first observation (relating to (i (a))) is one of the reasons for postulating "structural case" in Chomskyan Linguistics (cf. Chomsky 1981). The observation is that nominative and accusative cases obviously neutralize conceptual differentiations, i.e., they have quite a broad range of differentiations they code.
However, this observation and the postulation of structural case comes along with the neglect of the other observations (relating to (i (b) and (c))), this neglect being a consequence of the autonomy-of-syntax principle and the rejection of the notion of construction. In an autonomous syntax it is not interesting what case does for conceptualization, but only its role

in purely syntactic machinery. More specifically, the broad range of conceptual differentiations neutralized by the nominative and accusative cases appears broad only in relation to the apparent range of the dative case. The dative has extensively been shown to be conceptually more restricted than the other two cases, and therefore often been assigned the status of a lexical or inherent case (for an overview cf. Hole, Meinunger & Abraham 2006; see also Behagel 1923, Wegener 1985, Willems & Van Pottelberge 1998, Blume 2000). Accepting that the differentiations cases accomplish also depend on the constructions in which they occur means accepting that the degree of neutralization of the nominative and accusative in relation to that of the dative can only be of a gradual nature. Reconsider the NP_{nom}-V-NP_{dat}-NP_{acc} construction: I would purport that the range of the conceptual differentiations of the dative complement in this construction is not necessarily or considerably narrower than that of the accusative or even the nominative (see Figure 4.4 above for my suggestions in this respect). Applied to CL that means the difference between structural and inherent case fails to capture the semantics of cases inherent to constructions.
I will attempt here an Instruction Grammar characterization of the contributions that the dative makes to conceptualizations in the utterance-as-instruction perspective. I will do this using the actional, perceptual, and conceptual devices developed throughout this work, thereby differentiating it from the nominative and the accusative, and factoring in the insights from (i (a) to (c)) from the previous section. In particular, the following theses will be defended:

(i) The German dative codes
  (a) symmetrical and asymmetrical bi-directionality,
  (b) symmetrical and asymmetrical coinciding directionality,
  whereas the nominative and nominative-accusative code non-directionality or uni-directionality in fictive or concrete motion/movement;
  the dative also codes
  (c) (non-default) internal actional involvement.

Consider the first thesis (i (a)). It says that when a construction contains a dative form, this is an instruction to conceptualize its referent as moving concretely or fictively towards the referent of the nominative case bearer. At the same time the referent of the nominative case bearer shall be conceptualized as being concretely or fictively directed towards the referent of the dative case bearer. Thus conceived, the relation between both object concepts is bidirectional. *Stricto sensu*, both would have to be conceptualized as trajector and landmark at the same time, which is conceptually impossible but may be expressed with an exploited utterance (see Figure 3.33 in section 3.3.2). Factoring in the symmetry factor shows that this need not be the case. If a trajector is conceptualized as being directed to the landmark in the context of its circumstance and if it is then registered that the landmark is also moving, namely towards the trajector, this is very well possible. Exactly this situation is given in (4.15).

(4.15) *Der Dozent gratuliert/ begegnet/ dankt/öffnet Matthias.*
The.3NOM lecturer compliment/run-across/thank/open.3 Matthias.DAT

‘The tutor compliments/runs across/thanks/opens (the door to) Matthias.’

In (4.15) the tutor’s activity is directed towards Matthias. It is excluded, however, that the activity of the tutor succeeds, and that the verbalization of the circumstance with the respective verbs is appropriate if Matthias does not move, too, even though the tutor’s activity constitutes the major part of the whole circumstance. The contribution of both persons is thus asymmetrical. Nevertheless, the object towards which the tutor’s activities are directed also affords exertion of force and motion/movement. The latter is even necessarily actualized and works in a sense against the motion/movement of the trajector. This object is therefore not simply affected by the process/activity but contributes to the circumstance in that it has the potential to affect something by itself. This is in a very general manner depicted in Figure 4.10.

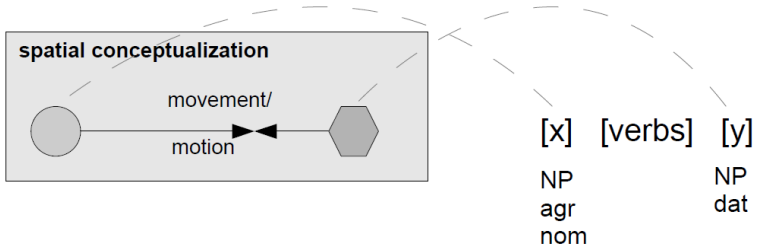


Figure 4.10: Asymmetrical bidirectionality in (fictive) motion/movement between trajector and landmark (dyadic relation)

An interesting side-effect of these considerations is that it is possible to predict that the dative referent in these constructions need neither be animate nor a traditional (secondary or co-) agent. What is required is only that the dative referent affords (and actualizes) exertion of force and/or motion/movement – which often though not always coincides with animacy. Concerning traditional agents, I reiterate what was mentioned above: In basic constructions (of which the one underlying (4.15) is an instance) case cannot code attribution or non-attribution of responsibility. Unless there is lexical material in the utterance that forces the interpreter into an interpretation with the attribution of responsibility, it is left to him/her whether he/she makes this attribution – presupposed the circumstance in question involves some activity on the side of the dative referent at all.

(4.16) *Matthias hat dem Professor einen Brief geschickt.*
Matthias.3NOM has.3 the.3DAT professor a.3ACC letter send.PTCP
‘Matthias sent the professor a letter.’

What has been said about (4.15) holds also true for (4.16), except that the directedness of Matthias’ activity does not find its destination in the professor but that Matthias sets in motion/movement some other object which is directed towards the professor, such that the professor must show some activity towards this object in order to make this circumstance one of *sending someone something*. In a more general manner this is depicted in Figure 4.11.

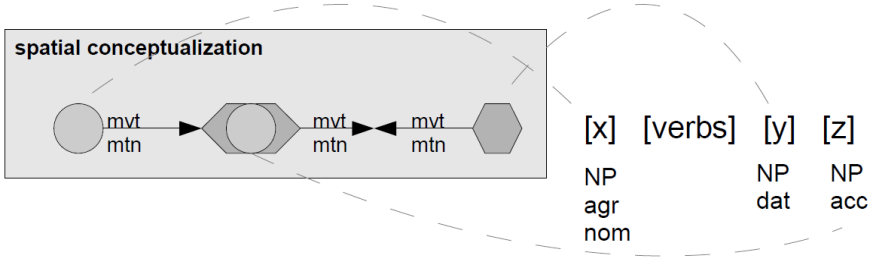


Figure 4.11: Asymmetrical bidirectionality in (fictive) motion/movement between trajector and landmark (triadic relation); (mvt: movement, mtn: motion)

In the conceptualizations underlying sentences (4.17), (4.18), and (4.19) below the aforementioned conditions are not met. This finds its expression in the absence of a dative form in these sentences (cf. (i (b))). The corresponding conceptual structures are also given, respectively.

(4.17) *Der Dozent sieht/mag/sucht/ prüft/ (unterstützt) Matthias.*
The.3NOM tutor see/ like/ look for/examine/(support).3 Matthias.3ACC
'The tutor sees/likes/looks for/examines/(supports) Matthias.'

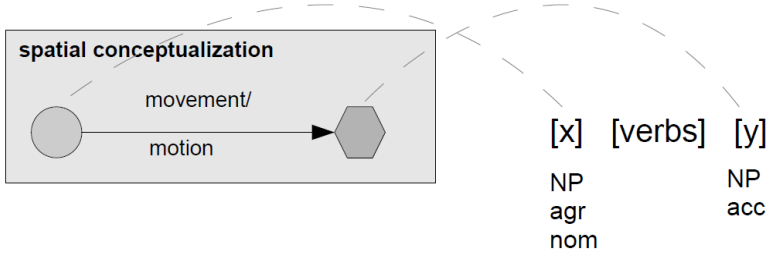


Figure 4.12: Uni-directionality in (fictive) motion/movement between trajector and landmark (dyadic relation)

(4.18) *Matthias hat einen Brief an den Professor geschickt.*
Matthias.3NOM has.3 a.3ACC letter to the.3OBL professor send.PTCP
'Matthias sent a letter to the professor.'

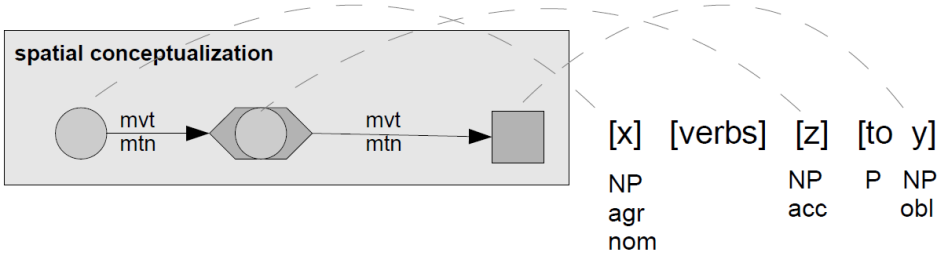


Figure 4.13: Uni-directionality in (fictive) motion/movement between trajector and landmark (triadic relation); (mvt: movement, mtn: motion)

(4.19) *Matthias tanzt.*
Matthias.3NOM dance.3

'Matthias dances.'

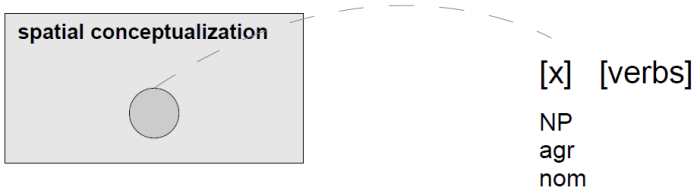


Figure 4.14: Non-directionality in (fictive) motion/movement (monadic relation)

Still dealing with (i (a)), let us turn to the case of symmetrical bi-directionality now. Consider (4.20):

(4.20) *Die Villa gleicht/ ähnelt einem Schloss.*
The.3NOM villa look-like/resemble a.3DAT palace
'The villa looks like/resembles a palace.'

The above sentence puzzles most case theories because there is a dative although there is no animate object and no movement/motion at all. However, taking a closer look at it, we find it similar to earlier examples from section 3.3.2 (involving Alex resembling Mario, the reverse and both resembling each other). It has been demonstrated that when A resembles (*gleicht/ähnelt*) B, B also resembles A, and that then B and A resemble each other (*gleichen/ähneln sich*). This is a symmetric relation, then. It has also been shown that it is impossible to conceptualize such a symmetric relation because the perspective dependence of perception/conceptualization allows only stating an asymmetric relation: The conceptualizer must fictively follow a trajectory from A to B in order to compare them. He/she cannot compare A to B and B to A simultaneously. In the course of conceptualization we have two uni-directional relations, then. This is depicted in Figures 4.15 and 4.16, respectively.

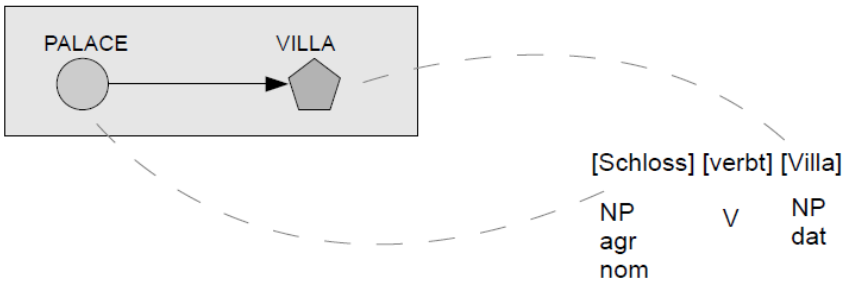


Figure 4.15: Asymmetric unidirectional fictive movement

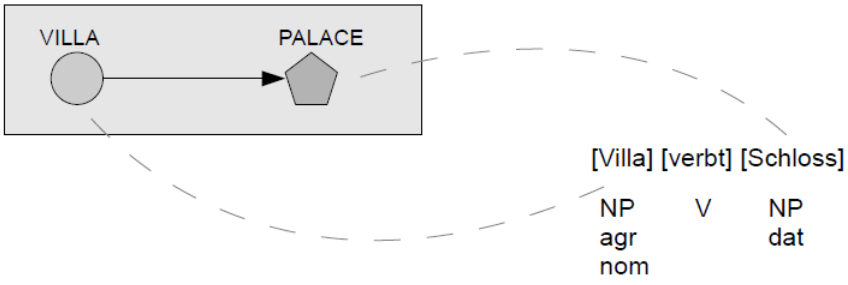


Figure 4.16: Asymmetric unidirectional fictive movement reversed

One would expect unidirectional relations to be coded by means of an NP_{nom}-NP_{acc} construction, in accordance to what has been said about (4.17) and Figure 4.12 above. That (4.17) works this way is caused by the fact that for the circumstances in this utterance ('see', 'like', 'look for', 'examine', ('support')) it is not true that if NP_1 $verbs_i$ NP_2, then NP_2 also $verbs_i$ NP_1. For 'resemble' and 'look like' in (4.20) this is true. Thus, two asymmetric unidirectional relations add together to yield a symmetric bidirectional relation. The difference between symmetric bidirectional relations and asymmetric bidirectional relations of the sort illustrated above lies in the conceptual partitioning of the former and the unity of the latter. Thus, where the conditions on symmetric and asymmetric bidirectional relations are not met, there will be no NP_{nom}-NP_{dat} construction.
(i (b)) (symmetrical and asymmetrical coinciding directionality) is closely related to (i (a)), although bi-directionality and coinciding directionality sound quite antithetic in the first instance. Consider (4.21).

(4.21) *Der Dozent hilft/folgt Matthias.*
The.3NOM tutor help/follow.3 Matthias.3DAT
'The tutor helps/follows Matthias.'

The difference to the cases in (i (a)) lies in the fact that in (4.21) Matthias is involved in an own activity which may also be directed to something unspecified. That means Matthias, as a trajector, is involved in some activity that may concern some object or location landmark (e.g., *help someone open bottles* or *follow someone into the mall*). The active/moving/causing aspect of the dative referent is thus similar to most instances discussed in the context of (i (a)). However, the referent of the nominative does not work "against" the other's directed activity but shares its directedness or path, but not necessarily its manner and its purpose, if there is any. Importantly, the success of the action schema actualized by the nominative referent existentially depends on the activity of the dative referent. Note that the involvement of responsibility on the side of the dative referent is again a lexical matter, not a constructional one: One can for some purpose follow a feather flying through the air, which cannot have a purpose. On the other hand, helping enforces the goal-directed activity of the one helped and of the helper. The purposes of both persons need not be shared, however, and both people need not know about the purposes of the other. That means coinciding directionality is indifferent with respect to we-intentionality. Although it is difficult to depict this, I have attempted it in Figure 4.17 below.

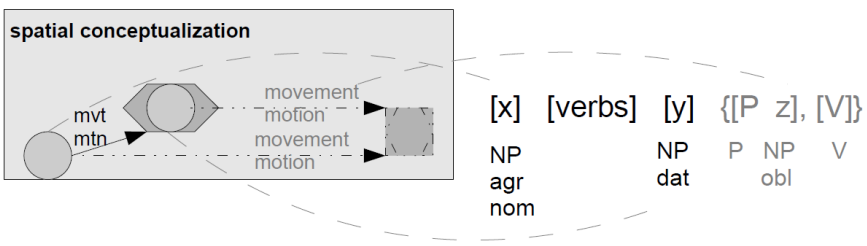


Figure 4.17: Symmetrical and asymmetrical coinciding directionality (mvt: movement, mtn: motion)

Figure 4.17 shows the following: The nominative referent, being a trajector, moves relative to the dative referent, being an object landmark in this function, e.g., by following it (symbolized by the solid arrow from the circle to the hexagon). The dative referent in turn is involved in a process/activity which is directed toward some object or location landmark (symbolized by the dotted lines leaving the circle leading to a dotted object/location landmark). In this function it is a trajector. Because the referent of the nominative is oriented towards the dative referent, it is consequently oriented towards the dative referent's destination. The same reason determines that the nominative referent need not have the same purposes for moving towards the unknown landmark as the dative referent. The motion/movement of the two trajectors and the landmark towards which they are directed are dotted because the verbalization (4.21) does not code them. This is also indicated by the grey shading of the prepositional phrase and the verb which may be added to the construction, yielding something like *Der Dozent hilft Matthias tapezieren* 'The tutor helps Matthias wallpapering' or *Der Dozent folgt Matthias in das Institut* 'The tutor follows Matthias into the institute'. Again, where the attribution of responsibility to the dative referent is possible and not lexically enforced, it may apply. It is, however, not constructionally coded.

Turning now to (i (c)), reconsider (4.16) above (*Matthias hat dem Professor einen Brief geschickt* 'Matthias sent the professor a letter'). There is no doubt that the professor is physically involved in this circumstance, given that the event succeeds. Now consider (4.22).

(4.22) *Alex hat Christina das Auto gewaschen*.
Alex.3NOM have.3 Christina.3DAT the.3ACC car wash.PTCP
'Alex washed Christina the car.'

In the event underlying (4.22) Christina need not be there when Alex washes the car. It suffices that it is Christina's goal or interest that her car gets washed or even that it does not get washed. The notions of goal and interest have been clarified in section 2.4 of this book. It is implicit in Figure 2.7 there that someone's purposes need not be put into effect by that same person but can also be realized by others. Were Christina not mentioned in (4.22) above, one would be led to attribute the purpose of the car's being clean to Alex. Were the professor left out in (4.16), this would not alter the motives of Matthias. Moreover, in contrast to (4.16) the dative complement in (4.22) can be left out in any information structural configuration, while this hardly possible in (4.16). What one finds in constructions like the one underlying (4.22) is one of the very special things that datives accomplish: The dative referent does not stand in a relation to the nominative referent and/or the accusative referent similar to the relation between the professor and Matthias, and between the professor and the letter in (4.16). Rather, the dative referent stands in a relation to the relation between the nominative and the accusative referent.

This is not true for the complements in (4.16). The dative in (4.16) is of type (i (b)). A linking schema for this type is shown in Figure 3.31, repeated here from section 3.3.2. I will contrast it with the type (i (c)) dative in (4.22) shortly.

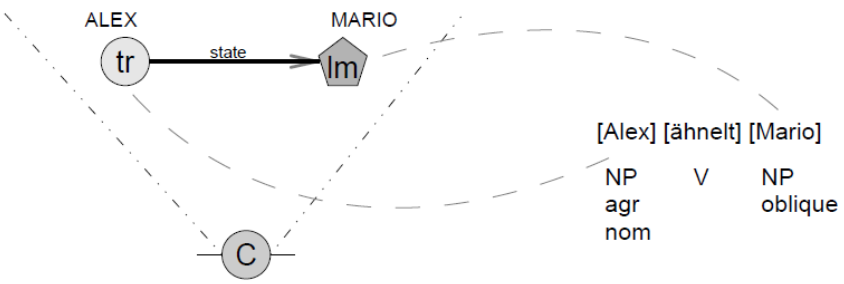


Figure 3.31: The role of the conceptualizer

Now, what happens in sentences like (4.22), containing a *dativus (in)commodi*, is that the goals and interests concerning the circumstance verbalized are not those of the conceptualizer but of some conceptualized conceptualizer. Thus, the speaker-conceptualizer projects a conceptualizer into the circumstance as the person with respect to which this circumstance is pertinent.

Strictly speaking, the speaker-conceptualizer stands in a relation to the relation in which the dative referent stands to the relation between the nominative and the accusative referents.

This is depicted in Figure 4.18 below. The speaker-conceptualizer is characterized here as the first person, the projected conceptualizer as a third person.

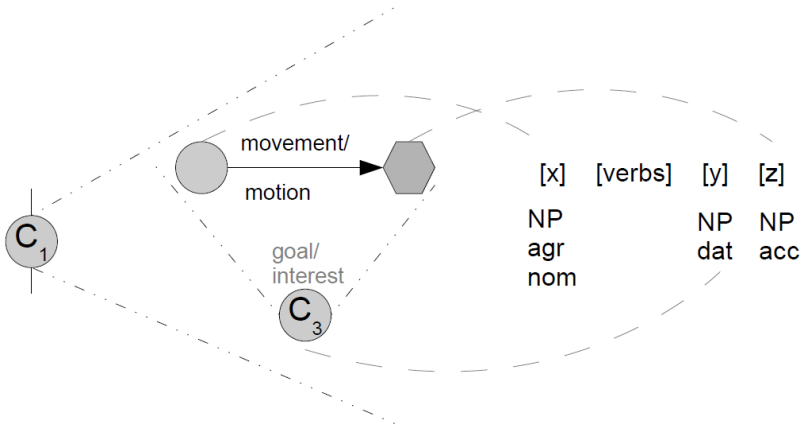


Figure 4.18: Dativus (in)commodi *as projection of someone's goals and interests towards a circumstance*

The classical *dativus possessivus* is often difficult to distinguish from the *dativus (in)commodi*. Consider (4.23) and (4.24).

(4.23) *Alex hat Christina die Haare gewaschen.*
Alex.3NOM have.3 Christina.3DAT the.3ACC hair wash.PTCP
'Alex washed Christina's hair.'

(4.24) *Alex schmerzt die Nase.*
Alex.3DAT hurt.3 the.3NOM nose
'Alex' nose hurts.'

The difference between (4.22) and (4.23) lies in the relation between the dative referent and the accusative referent. While in the former the relation may be one of possession, the latter must necessarily be one of possession, and it is often one of inalienable possession. Hair is one of the few things that are separable from a human body. In the usual case one deals with a part/whole relation relative to a human body. Strictly speaking, (4.23) is a dyadic relation between the object Alex and the object Christina such that Alex acts towards a part of Christina. The possessive relation between a possessor and a possessee has already been described in section 3.3.2. Conceptually, (4.23) instructs an interpreter to conceptualize a concrete movement of Alex (trajector) towards Christina (object landmark), whereas the relation between Christina (landmark) and her hair (trajector relative to Christina, landmark relative to the hair) is one of fictive motion. The part/whole relation including inalienability becomes especially clear in (4.24). Hurting is primarily a circumstance in which the nose is involved. But as a inalienable part of Alex the pain concerns Alex as a higher-order object. The difference between the possessive dative and the *dativus (in)commodi* can thus be characterized in the following way: The object affected by the circumstance (the car and the nose, respectively) stands in a part/whole relation in the former, while in the latter it does not necessarily. That means that in the case of the possessive dative the affected object is also the object (on a higher level of trajector-landmark configuration) which has some interest in or goal regarding the circumstance. In a sense they are coreferent.
Closely related to the above dative types is the classical *dativus ethicus*. I am not quite sure about how to characterize the exact differences between the ethical dative and the *dativus (in)commodi* in conceptual and actional terms, but it seems to me that the former is restricted to interests, i.e., to circumstances that shall be maintained or avoided from the standpoint of the speaker-conceptualizer. Moreover, its occurrence seems to be restricted to circumstances in which a speech act participant is involved and that concern the interests of another participant, i.e., first and second persons. In (4.25) below it seems to be the integrity of the window that is pertinent. In (4.26), which is not negatively formulated, it is the benevolence of the teacher that the speaker wants to maintain.

(4.25) *Dass du mir nicht das Fenster triffst!*
that you.2NOM me.1DAT not the.3ACC window hit.2
'Don't even think about hitting the window.'

(4.26) *Dass du mir ja den Lehrer grüßt!*
that you.2NOM me.1DAT PART the.3ACC teacher greet.2
'Don't even think about forgetting to tell the teacher I said hello.'

The corresponding conceptual structure and its linking are given in Figure 4.19 below. This conceptual structure seems also to hold for the *dativus iudicantis*. In constructions containing it the circumstance expressed is judged by the dative referent to exhibit some feature to a degree that does not lie in his/her interest, e.g., *Alex fährt mir zu langsam* (lit. 'Alex drives me[.DAT] too slowly'). There is always a degree particle indicating this.

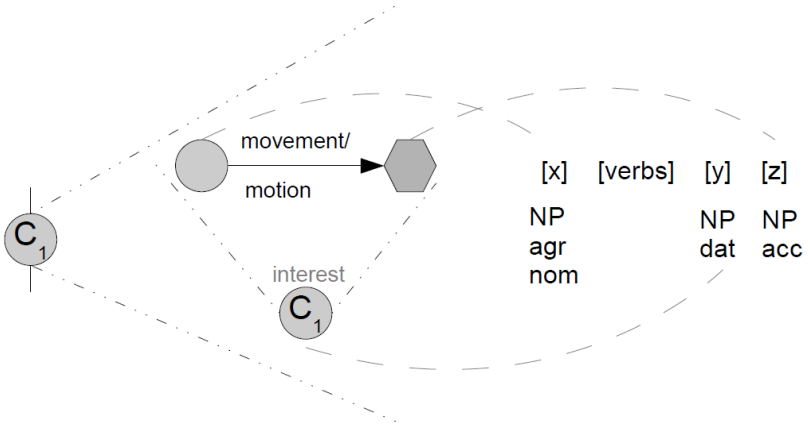


Figure 4.19: Dativus ethicus *and* iudicantis *as projections of someone's interests towards a circumstance*

However, (4.27) constitutes the most intricate matter. Its explanation solves the linking puzzle outlined in chapter 1 and in sections 2.2.1 to 2.2.8. It expresses a circumstance which ranges between those of the other dative occurrences. Here, the dative shares with the *dativus (in)commodi* an alienable relation to the referent of the other case bearer, one of possession (at least one having sth. at one's disposal temporarily) with the possessive dative, one of goal or interest with the ethical and/or bene-/maleficient dative, and one of activity with the datives in (4.15). This dative type can be deduced by combining (i (a)/(b)) and (i (c)) above: The dative referent is in any case involved in activity towards the other object – and makes contact with it. On the one hand Willi causes the glass to break, on the other hand, the breaking of the glass is, at least in a metaphorical sense, directed against Willi's intended activity towards the glass. It blocks Willi's movement by opposing it, blocking it, making it impossible.

(4.27) *Willi ist (#absichtlich) ein Glas zerbrochen.*
Willi.3DAT be.3 (intentionally) a.3NOM glass break.PTCP
'(It happened to Willi that) a glass broke.'

Deleting Willi in (4.27) yields the anticausative construction in (4.28). However, as has extensively argued in section 3.2 (especially 3.2.4), exerting force is independent of the attribution of responsibility which is not contained in a (simulated) percept of an event. That is why (4.28) in which a causer is not expressed is ambiguous between an accidental and an intentional breaking event.

(4.28) *Ein Glas ist zerbrochen.*
a.3NOM glass be.3 break.PTCP
'A glass is broken.'

If someone verbalizing the event underlying both (4.27) and (4.28) wants to suggest that Willi intentionally knocked over the glass, he/she has to utter something like (4.29)

(4.29) *Willi hat ein Glas zerbrochen.*
Willi.3NOM have.3 a.3ACC glass break.PTCP

‘Willi broke a glass.’

(4.29) still allows a reading in which Willi is not responsible for the breaking of the glass, but it suggests one in which he is. In order to make unambiguously clear that Willi is not responsible for breaking the glass, one has to do this lexically (by adding a disambiguating adverb) or utter (4.28) above which blocks attributing responsibility. I have attempted to depict this in Figure 4.20.

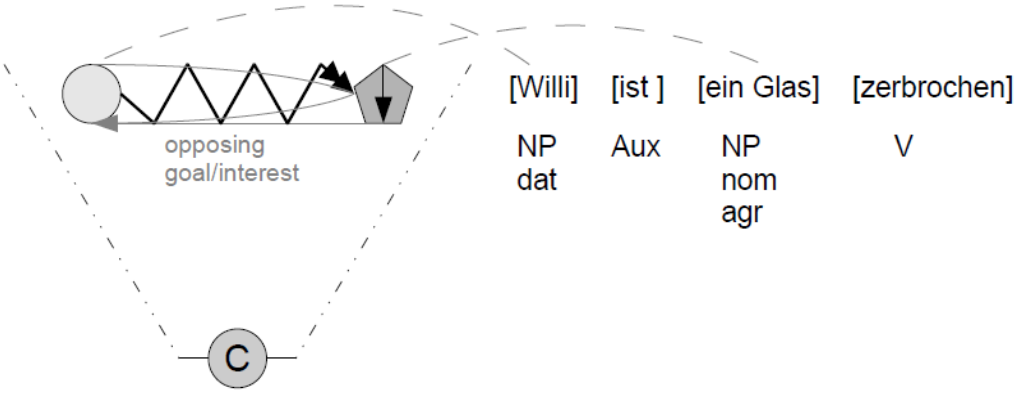


Figure 4.20: Dative of non-responsible causer

Interestingly, Figure 4.20 shows that there is an activity and a process compressed in this utterance: Willi’s activity towards the glass is only implicit but nevertheless relevant with respect to the fact that he pursues some purpose in holding the glass (unknown to us). The verbalized process is that of the glass changing from being intact to being broken, and it is this process that opposes Willi’s goals or interests.

The discussion of (i (c): “(non-default) internal actional involvement”) has shown that this dative type is given where the internal actional involvement (in the sense of purposes, i.e., goals and interests) of someone is verbalized who is not by default the person having some goal or interest regarding the circumstance in question, or someone whose actually intentional activity is thwarted by his/her accidental causing a change in something.

Before concluding the discussion about the dative, something shall be said about the constructions below which often contain datives. It shall broaden the survey of dative occurrences in German.

(4.30) *x* *wider*verb*t* *y*.
x.3NOM against-verb.3 y.DAT
‘x verbs against y.’

(4.31) *x* *ent*verb*t* *y*.
x.3NOM against/away-from-verb.3 y.DAT
‘x verbs against/away from y.’

(4.32) *x* verb*t y* *(z)* *zu/auf/etc.*
x.3NOM verb.3 y.DAT (z.ACC) to/on/etc.
‘x verbs (z) to/on/etc. y.’

(4.33) *x* *nähert* *sich* *y.*
x.3NOM approach.3 REFL.ACC y.DAT
'x approaches y.'

(4.34) *x* *gefällt* *y.*
x.3NOM please.3 y.DAT
'x pleases y.'/'y enjoys x.'

(4.30) and (4.31) contain a preposition/particle (*wider-* 'against') and a prefix (*ent-* 'against, away from, apart'), respectively. That means the dative forms in these sentences are suspected to depend on the preposition, i.e., on the meaning of the preposition. As such, they could be argued to have another status than the datives discussed above, where no such prepositions/particles and prefixes are there. Instances of *wider*verb- that occur with dative forms are *widersprechen* 'contradict, disagree' or *widerstehen* 'resist, withstand'. Instances of *ent*verb- that occur with dative forms are *entsprechen* 'correspond', orig. 'answer, respond', *entsagen* 'abdicate', or *entkommen* 'escape'. Besides the fact that the English paraphrases are often literal translations of the German (and Germanic) verbs, but using Latin borrowings (with prepositions/particles/prefixes like *contra-*, *re-*, *ex-*, *ab-*), it can be seen that one deals here with asymmetrical bi-directionality (i (a)) or asymmetrical coinciding directionality (i (b)): Someone or something that contradicts, withstands, corresponds (responds) to, or abdicates, someone or something exhibits movement/motion "against" some opponent movement/motion. Someone or something that escapes someone or something can be conceived of as a mirror picture (i.e., mirrored conceptualization) of the conceptualization underlying the circumstance of following (see Figure 4.17).
There are also instances of *ent*verb- occurring in NP_{nom}-NP_{acc} constructions, e.g., *entführen* 'abduct', *entwickeln* 'develop, evolve', or *entdecken* 'discover'. They strongly suggest that only uni-directionality is given because their landmarks either need not even afford motion/movement or exertion of force, and if they do, they need not have them actualized.
Possibly, similar things can be said about (4.32), although these cases seem more puzzling. Verbs of this sort are *zurufen* 'call out to s.o.' or *auffallen* 'attract' where there are spatial prepositions attached to the verb (as particles) that can be broken up syntactically (*x ruft… zu*). These types of prepositions/particles can be used locally and directionally. Here, the former seems to apply. On the one hand, this makes asymmetrical bi-directionality improbable, at least if we are talking about concrete motion/movement. Furthermore, it is well-known that the German dative aggregates functions of the Indo-European ablative, instrumental, and locative (cf. Behagel 1923). The datives in (4.32) can plausibly be argued to employ the locative function here, in that the one called out to and the one attracted are the loci of the call and the attractor, respectively. This is what Wegener (1985: 291) proposes for *nähern* and it seems applicable to *zurufen*, too. On the other hand, using *auffallen* appropriately requires a feature of the dative referent that many dative referents of bi-directional relations also employ, namely animacy. For verbs like *auffallen*, an analysis in which there is asymmetric fictive bi-directionality is also conceivable, in that some fictive turning toward the attractor in the sense of becoming aware of it is necessary on the side of

the dative referent. Being or becoming aware of something has been correlated with eye fixation and eye gaze in earlier sections. This is what underlies fictive motion.
The case of *zurufen* and *nähern* is more complicated in that it is possible to call out to and to approach whatever. The felicity conditions on the use of these verbs is nearly independent of the features and affordances of the landmark. (It has to be an object landmark in the case of calling out, however). This is why a locative analysis suggests itself. An alternative explanation for the case of *zurufen* could be a partial idiosyncrasy of transfers of information, which might (nearly universally) require the fictive turning towards the information emitter on the side of the landmark of the information, i.e., the dative referent in a *zurufen* circumstance, thus constituting an instance of (i (a)).
A last explanation for the case pattern in *zurufen* could work by invoking the general function of case categories, namely to differentiate the role of a case bearer from the roles of the other case bearers in a construction. *Zurufen* expresses a triadic relation, coded by a NP_{nom}-V-NP_{dat}-NP_{acc} construction. If one subscribes to the analysis that the dative referent in a *zurufen* utterance need not fulfill one of the conditions under (i (a–c)) above, then one would expect it to bear accusative case, just like the referent of the second postverbal NP, the information transmitted. Two accusative case bearers are possible in German with the verbs *lehren* 'teach s.o. sth.', *abfragen/abhören* 'ask s.o. for sth.' and *kosten* 'cost s.o. sth' which clearly show aspects of asymmetrical bi-directionality but also the "wrong" case pattern, just like *zurufen,* but reversed. I am not sure whether this is coincidental but the transferred "object" in all these cases is either information or preferably abstract (in the case of *kosten*: *Das kostet dich deine Stelle*, lit. 'That costs you your job' vs. *Das kostet dich zehn Euro*, lit. 'That costs you ten Euros'). It could be that this makes the case distribution with these verbs less stable than with concrete transferable objects. While one has little chances of success in finding non-dialectal instances of constructions like NP_{nom} *schickt* 'sends' NP_{acc} $NP_{acc[+figure\text{-}apt]}$, one can easily find instances of *kosten* and *lehren* constructions of the type NP_{nom}-*kostet*/*lehrt*-NP_{dat}-$NP_{acc[-figure\text{-}apt]}$.[174] To cut a long story short, two competing motivations seem to be at work here. Firstly, diagrammatic iconicity which shall maximize incremental interpretation in terms of the utterance-as-instruction view: The interpreter prefers distinct (case) forms for distinct conceptual differentiations (dative vs. accusative); and secondly economic considerations in the sense of associating more conceptual differentiations with fewer (case) forms (two accusatives) (cf. Hawkins' 2004: 34, 51 "Minimize Forms" and "Maximize On-line Processing"; see also Primus 1999). Minimizing forms and incorporating multiple conceptualizations into single forms means a step away from diagrammatically iconic motivation towards exploitation by conventionalization. Following up on the discussion about acquisition in section 3.3.6 I would therefore predict that double accusative constructions in German are disadvantaged in language comprehension and are acquired later.
Gefallen (4.34) is the last example that will be discussed here. It is closely related to *auffallen* but does not contain a productive preposition/particle like the latter. However, they behave similarly syntactically. The prefix *ge-* that is attached to the concrete meaning of *fall-* 'fall' can be traced back to older comitative and collective meanings (cf. Wilmanns ^{2}1899). Thus,

[174] Searching www.google.com for the strings *lehrt ihm* and *kostet ihm* yields 33.500 and 34.900 hits, respectively [29/03/2012]. Searching *schickt ihn* this way is impossible due to the syncretisms that the second object allows and the phrase order flexibility.

something "comes together at" the dative referent of *gefallen* which again makes a locative interpretation of this dative complement possible. Analyzing it in accordance to (i (a): asymmetric bi-directionality) or (i (c): internal actional involvement) does not seem to be impossible: In the former case it is again the aspect of being aware of the nominative referent (unlike *auffallen*, where s.o. becomes aware of sth.) that is required in the dative referent. It must therefore be animate and shows some fictive movement towards the nominative referent; one could also interpret the dative referent of *gefallen* (and that of *auffallen*) as one who has some interest in the circumstance in which the nominative referent stands. It would thus constitute a variant of the *dativus (in)commodi*. An argument in favor of such an analysis are intransitive utterances like *Er weiß wirklich zu gefallen* 'He really knows how to appeal (to s.o.)' and *Das fällt auf* 'That attracts (attention)'. In other words, "his" appeal and "its" attraction are actually intransitive circumstances that – when a dative complement is expressed, maybe grammaticalized – have some significance for the dative referent in terms of his/her goals or interests.[175]

A last comment concerns evidence from behavioral and neurolinguistic studies for reanalyses of dyadic sentences where the two pre-verbal NPs are ambiguous with respect to the PSC and trajector/landmark distribution, e.g., … *dass Peter* (nom/dat/acc) *Mädchen* (nom/dat/acc)…. 'that Peter girls…'. Anticipating aspects of the next section, the first ambiguous NP is preferably interpreted as the PSC coding the source of movement/motion, a causer or responsible person (which make classical prototypical agents). Now, if agreement information allows the verb in such sentences to disambiguate the ambiguity of PSC/trajector-landmark towards an interpretation violating this preference (e.g., *dass Peter* (acc) *Mädchen* (nom) *sehen* 'that girls see Peter' or *dass Peter* (dat) *Mädchen* (nom) *folgen* 'that girls follow Peter'), then the NP_{dat}-NP_{nom} order is accepted better than the NP_{acc}-NP_{nom} structure and the latter seems to require additional reanalysis procedures (e.g., Schlesewsky & Bornkessel 2003, 2006).

The present account of the dative taken together with the general preference for interpreting a first ambiguous NP as what is classically called a prototypical agent provides a plausible explanation for these findings: Many (nominative) PSCs of verbs taking dative complements allow semantically (i.e., with respect to conceptualization and attribution) diverse PSC referents: They may be inanimate objects, animate objects, even nouns designating circumstances, e.g. with *gefallen* 'appeal to'. The referents of the NPs bearing dative case are semantically far more restricted (see criteria (i (a) to (c)) above). That means from the perspective of what they afford, the referents of the dative NPs of such verbs are far more likely to satisfy the conditions of a classical prototypical agent (source of movement/motion, causer, attributed responsibility) than the semantically unrestricted nominative NPs in such constructions. It is thus rather unsurprising that with verbs imposing few restrictions on their nominative NPs like *gefallen* the phrase order NP_{dat}-NP_{nom} may even be preferred over the NP_{nom}-NP_{dat} order. Such preferences may exhibit intra-categorial variation: Not all verbs occurring in the NP_{nom}-V-NP_{dat} construction are similar. For instance, *folgen* 'follow', unlike

[175] If this latter analysis is right, one must wonder how to explain verbs like *wundern* 'amaze' and *interessieren* 'arouse interest' which occur in NP_{nom}-V-NP_{acc} constructions. Regarding this matter cf. Klein & Kutscher (2002) and the analyses proposed there. What can be said about so-called psychic verbs is that many of them can be traced back to spatio-temporal relations. These verbs often have preserved the constructional pattern of their original conceptualizations.

gefallen, requires two NPs that are quite similar in what they afford so that its PSC referent will – from the perspective of what it affords – be a similarly "good" PSC as the referent of the dative complement. So there is no reason to not interpret the first NP of *folgen* as PSC in incremental interpretation.
In case-ambiguous NP_{nom}-V-NP_{acc} constructions, the referent of the accusative complement mostly does not exhibit the properties of a dative NP referent (as listed in (i (a) to (c))). Thus, it mostly does not compete with the other referent (that of the nominative NP) for the PSC status because it lacks the features of a classical prototypical agent.
Thus, there are processing differences in the reanalysis of dyadic sentences with two ambiguous pre-verbal NPs towards either NP_{dat}-NP_{nom} or NP_{acc}-NP_{nom} orders because the semantic criteria licensing the dative are absent in the accusative referents of the latter construction. Processing differences of different verbs with the order NP_{dat}-NP_{nom} are due to the dative's being licensed by either (i (a) or (b)) on the one hand or by (i (c)) on the other, the latter making the NP_{dat}-NP_{nom} order more acceptable.

4.2 Reducing the remaining formal underspecification

The discussion in section 4.1 has demonstrated that the interplay of the formal constituents and mechanisms in syntax may, but need not provide interlocutors with sufficiently similar conceptualizations of circumstances to organize their interaction. But because interaction apparently works irrespective of the formal underspecification of linguistic^{o} structures, speakers and interpreters must do more than simply instructing others to conceptualize circumstances by means of utterances and taking utterances as instructions for conceptualizations, respectively. They must rely on cues that are not part of the signal and cannot be detected by distributional analyses of this signal. This holds true for the grammars of many languages. They differ in the degree to which they functionally "charge" their formal and non-formal cues, such that cues relevant in one language may be redundant in another language. The non-formal cues are nevertheless available to any speaker of any language, since they are grounded in our physical make-up and in aspects of action, perception, and conceptualization – aspects that concern all human beings in equal measure.
One of these non-formal cues has already been discussed, and this shall not be repeated here. When presenting the contributions of the "bare" construction, the "bare" noun, the "bare" verb, and that of case morphology, the notion of affordance has already played a prominent role. Now, affordances are not part of the signal, but play a huge role in (incremental) interpretation and conceptualization in that they belong to the referents of NPs which crucially make up constructions and are case bearers. What affordances do for incremental interpretation was presented in section 4.1. The other notions will be discussed in the present section. Throughout the discussion I will show that affordances and the other cues can be reduced to a common denominator that can be viewed as the rationale behind their utilization in linguistic^{o} interaction: the need for closure at the scale of circumstances. Closure is attained where the "front end" of a circumstance is determined, as it were. This will be clarified throughout the following sections.

In brief, in producing utterances speakers realize, and in interpreting utterances interpreters make use of exactly those cues that are instrumental in identifying the boundaries, especially the "front end", of a circumstance.

4.2.1 The PSC preference as epiphenomenon of a (responsible) causer preference

Consider (4.2a) from section 4.1.4 again.

(4.2a) ... *dass die Frau* *das Mädchen* *sieht*.
that the woman.3SG.NOM/ACC the girl.3SG.NOM/ACC see.3SG
'that the woman/the girl sees the girl/the woman.'

(4.2a) represents the fact that often in German neither phrase order nor the construction, the affordances, morphological agreement nor case suffice to definitively fix the trajector/landmark and PSC distribution in the interpretation of an utterance. This is a local but regular feature of Standard German that is among other things caused by several case syncretisms (in feminine and neuter genders, respectively) in which the nominative – as the case agreeing with the verb – is involved. When we take a look at English we see that phrase order accomplishes the disambiguation of the trajector/landmark and PSC distribution.

(4.2c) ... *that the woman sees the girl*.
'woman = seer'; *'girl = seer'

Given this option is not ruled out by strong formal and non-formal competing cues (cf. MacWhinney, Bates & Kliegl 1984), one can state that in German it is the first ambiguous complement phrase encountered that is preferably interpreted as the PSC, even though both position and case are not necessarily associated with one another in that language (mostly called "subject preference", cf. Hemforth, Konieczny & Strube 1993, Schriefers, Friederici & Kühn 1995). What is the explanation for such a preference? I would argue that the PSC, or subject, preference is an epiphenomenon of another preference. This latter preference is one for a concept that closes a circumstance concept causally, according to the large-scale law of closure (cf. section 3.2.1.4, paragraph (b)). That means actors/cognizers strive for delimiting circumstances they perceive – or simulate to perceive – mainly at the "front" and (only) secondarily at the "back", i.e., where they begin and where they end, will end, or how they proceed. In the optimal case, this allows predictions as to the pertinence of some circumstance (i.e., the involved objects) in question for one's own action planning: Will I have to interact/interplay with the objects in that circumstance? Do/will they threaten me? Do/will they aid my purposes? Predictability, in turn, is maximal if the beginning of a circumstance is identified/categorized or conceptualized as being responsible for the coming about of the whole circumstance, or as having caused the coming about of the circumstance. If the causer (or, by means of attribution, the causer attributed responsibility) of a circumstance is identified/categorized or conceptualized by an actor/cognizer, his/her action planning possibilities are maximal in that nothing imponderable about that circumstance remains. Knowing the causer means knowing what he/she/it is capable of – what he/she/it affords. This

makes possible integrating these objects, or circumstances of these objects, into one's action plans in terms of purposes (cf. sections 2.4 and 3.2.1.1). In contrast, putting purposes into effect involving objects whose circumstances are hardly or not at all calculable is difficult if not impossible. Now, causers and/or responsible persons temporally precede their effects, in the environment, in perception, and in conceptualization. Causers/responsible persons (literally or metaphorically) move and exert force. They are therefore mostly trajectors (but also landmarks in the case of inverse mappings with *obtain*, *buy* etc.). In both – conceptually motivated – cases they are diagrammatically coded as PSCs in German.

Therefore, the preference for the PSC interpretation of the first ambiguous complement in German is actually an epiphenomenon of the preference for a cognitively deeply grounded (responsible) causer (subsequently called RCP for "(responsible) causer preference").

This is depicted in Figure 4.21.

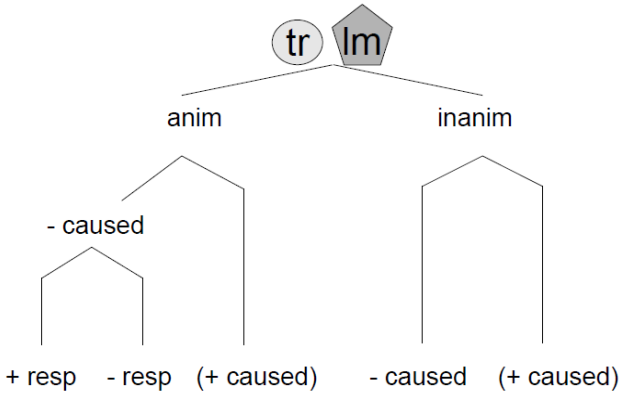


Figure 4.21: PSC preference as "(responsible) causer preference"

I am not quite sure about the status of causers that are causally affected themselves. They are put in parentheses in Figure 4.21. When encountering the ambiguous NPs in ... *dass das Korn das Huhn* (lit. 'that the grain the chicken') the grain presumably does not satisfy the conditions for a (responsible) causer, while the avalanche in ... *dass die Lawine die Berghütte* (lit. 'that the avalanche the mountain shelter') presumably does. One reason could be that an avalanche is not perceived, identified/categorized, or conceptualized as being caused, while a grain is when it is moving – at least in relation to a chicken, i.e., regarding their mutual affordances.

Together with the considerations about cognitive efficiency in section 4.1.3 above, this means that the actor/cognizer in general, and the incrementally interpreting person in particular, strive for simple monadic circumstances that are causally closed by a (responsible) causer. The present theory makes the prediction that this should in principle be a universally valid preference in that striving for the closure of circumstance concepts is basically perceptually grounded (in interplay with the cognitive make-up of the actor/cognizer). Variation may appear in the culturally constrained role of attribution that operates on spatio-temporal conceptualizations. There is evidence for this prediction from neurolinguistic data from typologically diverse languages. It seems to confirm that the way in which the first ambiguous NP encountered in the comprehension of an utterance is interpreted is connected with the PSC

only because the PSC is often associated with the agent role, or "prototypical actor", as Bornkessel-Schlesewsky & Schlesewsky 2009b put it, adopting RRG terminology. I have attempted to reconstruct agentivity, or prototypical actorhood, here by means of attribution of responsibility (the notion of which I deduced independently from neurolinguistic data, namely from philosophical and socio-pragmatic considerations, and from social psychological insights; see sections 3.2.2 to 3.2.4). A person attributed responsibility and additionally identified as a causer (the concept of which I – again independently – deduced from the workings of sensation and identification) is closely related to what Bornkessel-Schlesewsky & Schlesewsky call a "prototypical actor".

4.2.2 Animacy and the RCP

What the RCP can provide in incremental interpretation is the following: It makes possible that an interpreter "assigns" the referents of "incoming" complements to their "roles" in a circumstance concept even before he/she knows whether the predicted circumstance is adequate at all. The "roles" in a circumstance concept concern mainly those of trajector and landmark and of (responsible) causation. In addition, what the interpreter does in incremental interpretation – namely using any available cue at any moment during comprehension to predict these matters – is also what he/she does if he/she is confronted with a globally ambiguous utterance, i.e., if the utterance leaves open the exact nature of the circumstance even if it is already completed: Then, the interpreter utilizes those non-formal cues that are particularly functionally charged in his/her language (in the sense of Bates et al. 1982, MacWhinney, Bates & Kliegl 1984; note that these are not models of incremental interpretation), thus suggesting a specific unambiguous conceptualization (and attribution) for a formally underspecified utterance. A famous notion that is supposed to play a particularly important role as a non-formal cue to disambiguation is that of animacy. Technically speaking, the notion of animacy is supposed to be involved primarily in several other typological observations that have been made throughout the last decades, concerning, for instance, case marking (cf. Comrie 1981), word order (cf. Stolz et al. 2008), subject selection (cf. van Valin & LaPolla 1997), and many others.

However, animacy has mostly served as a cover term in the literature for something that defies a clear characterization. The difficulty lies in the fact that the observations are based on typologically quite stable oppositions that can be systematized along a scale or hierarchy, i.e., an animacy hierarchy. A possible formulation of the hierarchy is the following (cf. Silverstein 1976, Comrie 1981, DeLancey 1981, Bickel 2010):

(4.35) 1st person pronoun ≥ 2nd person pronoun > 3rd person pronoun > proper noun > human noun > animate noun > inanimate noun > count noun > mass noun > abstract noun

A glimpse at the hierarchy in (4.35) suffices for us to realize that the heading "animacy" hierarchy is somehow arbitrary. What we find is discourse-pragmatic notions (person), categorial notions (pronoun vs. noun), specificity/individuation notions (count vs. mass vs. abstract), and the eponymous semantic notions (human vs. animate vs. inanimate). In what

follows I will treat these notions separately. The present section deals with animacy in the strict sense, the following sections deal with the individuation and person notions, including the pronoun-noun difference. One more remark is in order. The formulations of the hierarchy in (4.35) and of the particulate scales following below are quite general. However, there are language- and culture-specific moldings of these scales, where, for instance, gods, cats, or celestial bodies may range between pronouns and proper nouns in (4.35).
Empirical evidence for the utilization of animacy information for the decoding of utterances comes from the "competition model" (cf. Bates et al. 1982, MacWhinney, Bates & Kliegl 1984). In this model, animacy is treated as a cue to the decoding of an utterance just like the formal cues discussed above – with the difference that it (mostly) has no formal expression. Functionally, it works similarly. Before clarifying how animacy accomplishes this, we must clarify what animacy actually is in its function as cover term for (4.35). In section 3.2.2.2 this question has already been touched. It has been stated there that we "understand" the actions of others (or not) and attribute purposes to them (or not) to the degree that they are similar to us, i.e., that they are capable and competent of doing the same things to the same ends as we do (see also Langacker ^{2}2002: 248, Dahl 2008 for related proposals[176]).

From this perspective the notion of animacy can be reduced to the notion of (supposed) similarity to the self with respect to the capability for purposeful action and means-end rationality.

This is also the rationale behind the fact that "human" and "animate" can both be found in the above hierarchy. The relevant animacy sub-scale of the "animacy" hierarchy is thus the one given in (4.36).

(4.36) human > non-human animate > inanimate

I think animacy can be characterized as an instantiation of the (responsible) causer preference in the following sense: In previous sections (see sec. 3.2.1.2) it has been noted that what stimuli top-down afford to actors/cognizers depends crucially on the salient features of the former and on what is pertinent to the latter. The salience of stimuli serves mainly to sustain our well-being in that it helps detect things moving in our environments and potentially threatening us, while pertinence is most closely related to planning action und realizing purposes. Through the frequent co-occurrence of particular features in particular things they may especially afford particular circumstances to us. It can now easily be shown how this relates to animacy and the present context: Human "things" are highly salient in that they nearly always move without an observable cause. They are thus hardly calculable for us. At the same time they are very often highly pertinent to us in that they are important in our putting purposes into effect which makes their calculability maximally desirable. It is also very likely if not certain that they pursue their own purposes that might conflict with our own. Something similar is true for non-human but animate beings. The difference between animals and humans lies in the fact that we inter"act" less often with the former, that domesticated animals are quite well controllable, that they seldom pursue purposes conflicting with our

[176] As mentioned ealier: In contrast to these proposals, I attempt an action-theoretic grounding of this hierarchy.

own, and so on. Finally, inanimate things hardly ever move, thus hardly ever threaten us, do not interfere with our purposes, and are quite well calculable. The particulate animacy scale leading from human animates over non-human animates to inanimates can thus be read from left to right as a decrease in the likeliness of an object to be a (responsible) causer. However, in incremental interpretation or in the interpretation of a (globally) formally underspecified utterance the interpreter strives for closing the circumstance at the "front end" in terms of the RCP. An NP referent unlikely to be a (responsible) causer of a circumstance forces the interpreter to further look out for the "real" (responsible) causer, causing an additional cognitive load. In other words, the degree of animacy of an object correlates with the probability that it closes a circumstance at the "front end".
Now, how does this psychological observation aid the interpretation of formally underspecified utterances? Animacy information is simply one aspect of what affordances accomplish in interpretation. Affordances may specify in interpretation what is formally underspecified. Animacy demonstrates this in that human "things" afford circumstances different from non-human animate and inanimate things.

This results in an interpretation maxim that could be formulated as follows: If formal cues do not suffice for determining which complement referent is the (responsible) causer, trajector, or landmark, then act on the assumption that it is the most animate complement referent available.

4.2.3 Individuation and the RCP
Extracting individuation information from the "animacy" hierarchy in (4.35) yields a sub-scale consisting of the following units:

(4.37) individuated > non-individuated > abstract

These units concern percepts and concepts. Individuated are those stimuli in perception that are figure-apt, e.g. an apple or five apples. In other words, objects are individuated. They correspond to count nouns on the animacy hierarchy. In constrast, locations are not individuated, e.g., the grass in which the apples are lying. But when they become spatially delimited, locations can also be treated as objects, since delimitation is accompanied by becoming figure-apt, e.g., as a cluster of blades of grass. Non-individuated, but nevertheless perceivable stimuli correspond to mass nouns on the animacy hierarchy. Abstract "things" concern perception and conception only in a negative sense. They are neither unique percepts nor unique concepts. Abstract expressions, as they occur in the "animacy" hierarchy, may they be words or phrases, are exploitations and as such instances of hypostatization or compression. In other words, it is not things that are abstract. Guilt, justice, evenings, or unemployment are not things but words for multiple conceptualizations plus attributions.
Concerning the role of individuation for the decoding of utterances, it works analogously to animacy (in the strict sense). The particulate individuation scale leading from individuate over non-individuate contents of perception and conceptualization to abstract circumstances can be read from left to right as a decrease in the likeliness of an object to be a (responsible) causer.

And analogously, this results in an interpretation maxim that could be formulated as follows: If formal cues do not suffice for determining which complement referent is the (responsible) causer, trajector, or landmark, then act on the assumption that it is the most individuated complement referent available.[177]

4.2.4 Person and the RCP

In a face-to-face verbal interaction, saying *I read books* is an instruction for conceptualizing me reading books for my interlocutor, i.e., "the you" of my verbal contribution. Hearing *I*, my interlocutor refers this to me, the locutor, and not to himself, although he/she would also utter *I*, if he/she was uttering something with him/her as PSC. We both refer to others in the same manner, however, i.e., the referring expression does not change reference in dependence of whether I or you are using it. The otherness of the other is constituted by his/her/its non-attendance to the (face-to-face) verbal interaction which requires joint (visual) attention. He/she/it is no a speech act participant (SAP; cf. DeLancey 1981). This is depicted in Figure 4.22. The dotted lines symbolize the visual fields of the interlocutors and the other. The fact that the interlocutors find themselves in each others' visual fields shall indicate that they exhibit joint attention. The fact that the other person who the interlocutors are conceptualizing also has something in its visual field but that he/she is absent indicates that he/she cannot participate in the verbal interaction in terms of joint attention.

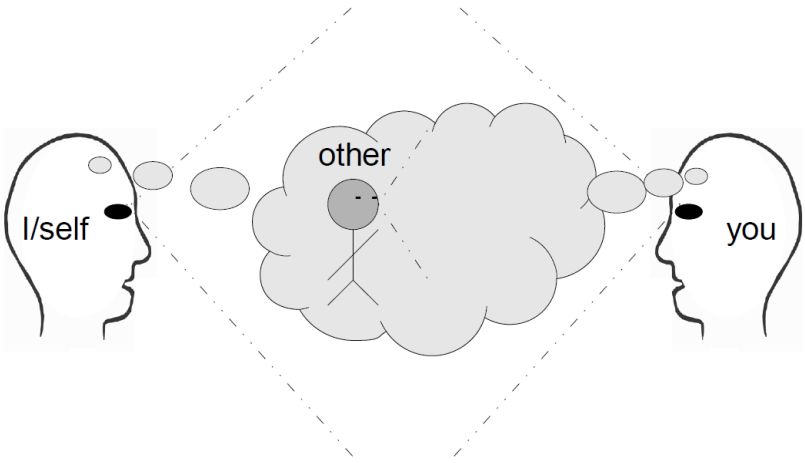


Figure 4.22: Asymmetry between SAP and non-SAP

The asymmetry between SAPs and non-SAPs is captured in the "animacy" hierarchy in terms of first, second, and third person pronouns. The particulate scale is from the perspective of the referents is thus the one in (4.38).

[177] It shall not be concealed that it is one function of determiners – a formal unit – to mark individuation. Notwithstanding, individuation is treated here as a non-formal cue, since definiteness, as marked by determiners, has a very prominent second function, namely marking the parameters "mentioned earlier" or "not mentioned earlier" (cf. Dik 1997). Information structure is not the topic of this book, however. It seemed more appropriate to me to treat the semantic part of definiteness as a non-formal cue than as a formal cue which would have made it necessary to differentiate the formal contributions of individuation and information structure which seems illusory to me.

(4.38) referent of *I* ≥ referent of *you* > other referents

Tying in with the ideas presented above, one can evaluate what the significance of these notions is for decoding underspecified utterances. I have argued that actors/cognizers strive for maximizing the predictability of circumstances, and that it is most effective to determine the (responsible) causer of a circumstance as fast as possible, or, in terms of incremental interpretation, as early as possible, given the incoming data. It seems obvious then that it is highly more pertinent for an interpreter when he/she hears his/her interlocutor utter *Ich…* 'I' than when he/she hears him/her utter *er/sie/es…* 'he/she/it'. The referents of both *Ich* and *er/sie/es* are potential (responsible) causers the affordances/circumstances of whom need to be calculated, but the interpreter is immediately affected by this, when it is his/her vis-à-vis interlocutor in his/her close environment than when it is some detached other person or thing. The significance of the referent of *you*, uttered by the interlocutor, is hard to evaluate but it seems plausible to assume that the interpreter has a considerably greater interest in being a (responsible) causer than in being affected by a (responsible) causer.
The particulate person scale leading from the referent of *I* over the referent of *you* to other referents can be read from left to right as a decrease in the pertinence for the interpreter of an object to be a (responsible) causer.

And analogously, this results in an interpretation maxim that could be formulated as follows: If formal cues do not suffice for determining which complement referent is the (responsible) causer, trajector, or landmark, then act on the assumption that it is a speech act participant.

4.2.5 Empathy and the RCP

The only notion that has not yet been extracted from the "animacy" hierarchy into a particulate scale is that of proper noun. The particulate scale that comes to my mind is that of empathy (cf. Kuno & Kaburaki 1977). Adapted to the present context it states that the interpreter is empathic mostly with himself, then with kin, then with persons he/she calls by their name, and then with others.

(4.39) self > kin ≥ person > others

It is not possible to separate empathy properly from the particulate animacy scale, the person scale, and the individuation scale. This is also the reason why sometimes the "animacy" hierarchy as a whole is termed "empathy" hierarchy (e.g., Lehmann 1998). I am not sure whether empathy as it is formulated in (4.39) above serves as a cue to the disambiguation of underspecified structures similarly to animacy, individuation etc. This awaits empirical research. It is conceivable, however, that the scale can be read from left to right not as a decrease in the likeliness of an object to be a (responsible) causer but as a decrease in the calculability of the referents given that they are (responsible) causers. I am most certain about my own acts, I am quite certain about the acts of the persons nearest to me, less certain about the persons I know more or less well, and least certain about those I do not know.

The tentative interpretation maxim is the following: If formal cues do not suffice for determining which complement referent is the (responsible) causer, trajector, or landmark, then act on the assumption that it is the one you are most empathic with.

4.3 Linking in performance

All sub-competences listed in the introduction to part I have now been assembled. Broadly, these are actional, perceptual, and conceptual competences. It is time to demonstrate how the linking competence is applied to utterances in interpretation, how it shows up in the verbalization of concepts, and how the sub-competences get utilized.
For the sake of clarity, the following subsection summarizes certain relevant aspects of the linking competence that are widespread through this work.

4.3.1 Motivated construction-conceptualization mappings

Relying on diagrammatic iconicity, according to which syntactic constructions reflect object concepts and the circumstances between them in a quite regular manner, the following schematics depict what actors/cognizers know about regular conceptualization-syntactic construction mappings. The constructions are the most important and most frequent ones taken from German. Motivated mapping has thus far been demonstrated using the example of the NP_{nom}-V-P-NP_{obl} construction (see sections 3.3.2 and subsequently). This is repeated here:

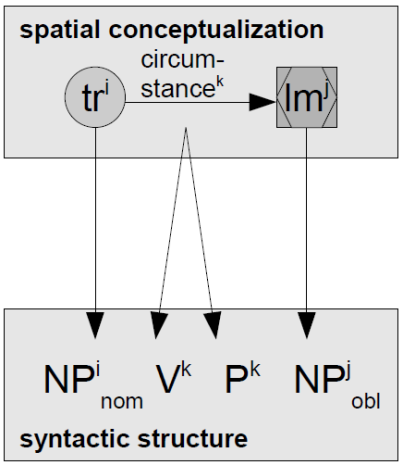


Figure 4.23: Motivated mapping

In what follows, the motivated mapping mechanism is demonstrated quite generally by applying it to the other constructions. Additionally, case information is also taken into account. Concerning agreement morphology, the nominative complement – as PSC in German – also agrees with the verb in person and number categories.
Some comments are in order before demonstrating the linking schemas. In particular, there are several variables that cannot be depicted simultaneously but that are of crucial importance

for the linking competence: Firstly, the following linking schemas depict motivated linkings which I consider the cognitive anchor in producing and comprehending instances of exploiting utterances. Secondly, circumstances can be conceptualized egocentrically or allocentrically which is not depicted here. Thirdly, the whole temporal grounding is aggregated in these schematics. They are considered to apply to simple as well as to complex circumstances. Fourth, the whole theory put forward here treats verbs and their conceptual correlates (which are actually neglected because they manifest only in objects) obviously "like a red-headed stepchild". The question of what is necessary to be able to link signals with conceptualizations was answered mainly by recourse to object concepts. Agreement morphology on the verb alone played a role as well as the sporadic mentioning of the lexicalization type of a verb. The importance of the latter shall be emphasized here. In fact, the verb loses something of its pivotal role in syntax, more precisely in incremental interpretation, to the power of affordances but it often remains pivotal in syntax in relation to the complements (see section 3.5) in definitely determining the nature of a circumstance. What actors/cognizers need to know in order to be able to link a verb to a conceptualization properly is the following:

- the lexicalization type (Is the trajector or the landmark the PSC?),
- whether it codes responsibility lexically,
- (the spatial-conceptual structure it codes (which is already rather a feature of the involved objects; see secton 3.5)).

This can be exemplified using the verb *herunterwerfen* 'knock over/throw down'. I am not quite sure whether this verb codes responsibility definitively or not. In Figure 4.24 below it is taken into consideration, at least.

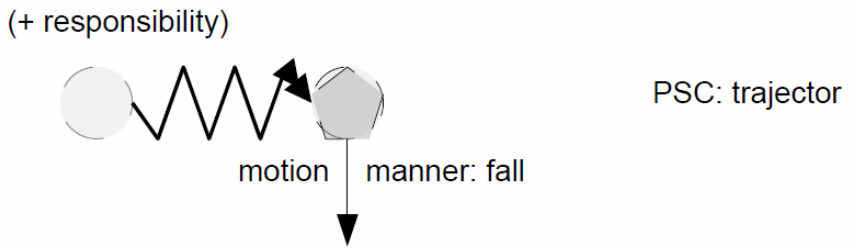


Figure 4.24: Instruction for conceptualization for herunterwerfen *'knock over/throw down'*

Computational and/or generative theories call this a lexical entry. I would rather treat it as a highly routinized action schema, employing the higher-order forms of learning: Under certain conditions a speaker actualizes this action schema, namely either by building up a particular conceptualization when hearing a form of the word, or by uttering it as a consequence of the same conceptualization. The shaded and dotted trajector and (object) landmark symbols indicate that they must be conceptualized first in order to instantiate, or constitute the circumstance designated by the verb.
Sixth, the directions of motion/movement in the schematics are exemplary. They need not necessarily be shaped that way but may vary.
Below, the first construction is depicted.

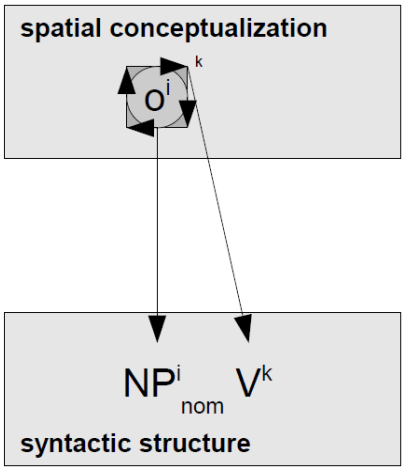


Figure 4.25: NP_{nom}-V construction

In the case of the regular motivated mapping a simple monadic circumstance is coded by the construction in Figure 4.25. As discussed in previous sections, this construction is highly homonymous because the single NP can code a high number of differentiations (see Figure 4.2 in section 4.1.1).

Figure 4.26 depicts one instance of a dyadic circumstance in which a dative complement codes symmetric bi-directionality (as in *ähneln* 'resemble'). It is a placeholder here for the regular linkings of datives in dyadic circumstances in general (see section 4.1.6.2). The landmark referents in these constructions are mostly objects, not locations, because they often "oppose" the trajector which frequently correlates with animacy.

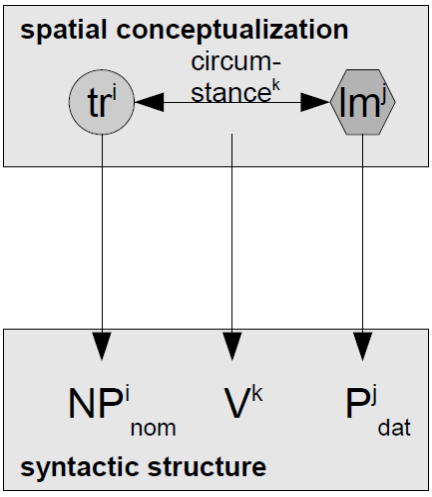


Figure 4.26: The NP_{nom}-V-NP_{dat} construction

Another rather homonymous construction is the one in Figure 4.27. It captures all cases of non- or uni-directionality in the relation between two objects. Here too the landmark is mostly an object, since it often holistically affected (see section 3.4.7 and 4.1.3 on holistic objects and their relation to NPs and PPs).

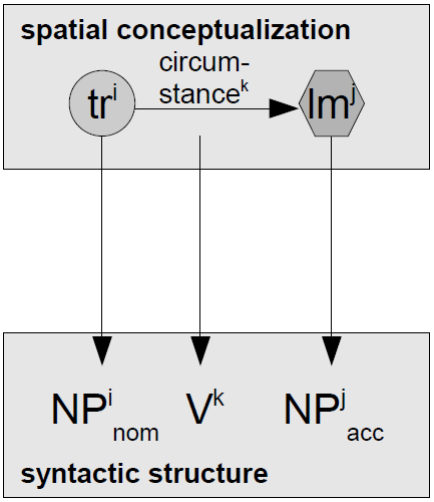


Figure 4.27: The NP_{nom}-V-NP_{acc} construction

The same is not true for the construction in Figure 4.28, where the circumstance between trajector and landmark involves a path. The landmark may be an object (e.g., *Alex jumps against the wall*) or a location (e.g., *Alex jumps into the water*). The subscript under the landmark coding NP indicates that the case (i.e., oblique) is not motivated by the same rationale as in the cases where there are no paths in the conceptualization. The rules for case governed by verbs are included in sections 4.3.2, 4.3.3, and in section 4.1.6.2 on the dative.

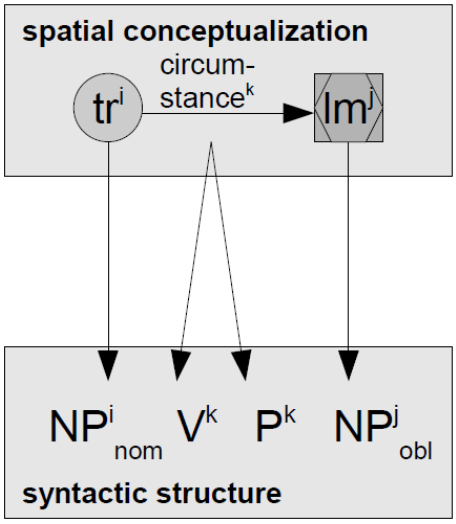


Figure 4.28: The NP_{nom}-V-P-NP_{obl} construction

The construction in Figure 4.29 is the famous, so-called double object construction. It was discussed in some detail in the section on the dative (section 4.1.6.2). It serves as a placeholder here for all polysemous instances of this construction. The Figure below compresses the sub-parts of the triadic circumstance. Actually, the trajector first acts on the accusative referent with the consequence that it moves towards the dative referent who moves towards to accusative referent which qualifies it for bearing dative case.

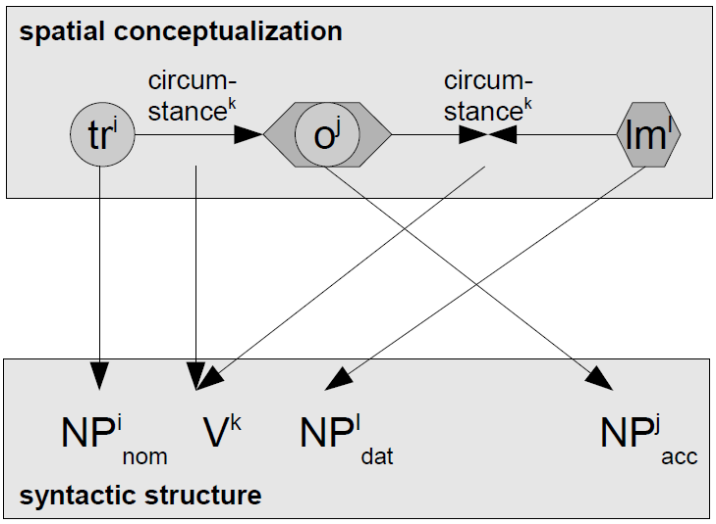


Figure 4.29: The NP_{nom}-V-NP_{dat}-NP_{acc} construction

The so-called prepositional object construction in Figure 4.30 below is known to concur with the double object construction as the verbalization for supposedly similar conceptualizations. Its mapping conceptual onto syntactic units looks quite straightforward – which is due to the compression of its actual complexity into the schematic. The conceptual (and partially actional) differences to the above construction have been demonstrated in section 4.1.6.2. In brief, the physically and actionally contingent involvement of the oblique NP referent does not qualify it for bearing dative case. The alternation between this and the former construction will be addressed in section 4.4.4.

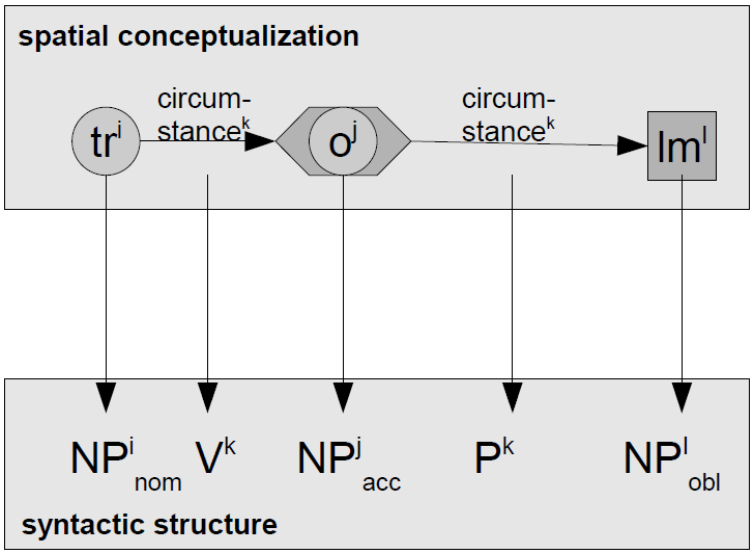


Figure 4.30: The NP_{nom}-V-NP_{acc}-P-NP_{obl} construction

The variant of the "prepositional object construction" with a dative complement is given in Figure 4.31. The dative is motivated quite predictably. We have here conceptual object that acts purposefully towards some landmark and which is accompanied by a trajector who is at the same time directed towards the other actor and the landmark of the other actor (e.g., *Alex follows the woman into the store*). This schematic compresses an actually more complex circumstance into one.

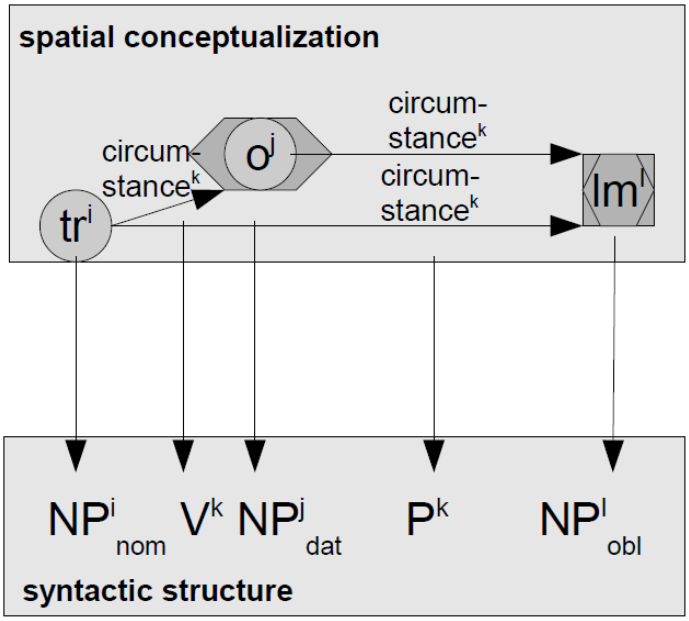


Figure 4.31: The NP_{nom}-V-NP_{dat}-P-NP_{obl} construction

The last construction illustrates the linking in an alternative manner. It shall be representative of all verbs that lexicalize their landmark expression as PSC (verbs of the types of *have*, *buy*, *receive*, *obtain* etc.). This has been discussed in section 3.3.2 by means of the example *I have a headache*.

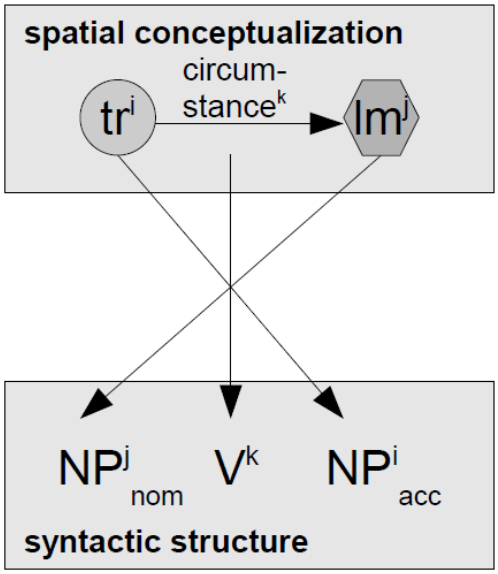


Figure 4.32: Inverted mapping/alternative lexicalization (exemplified by means of NP_{nom}-V-NP_{acc} construction)

4.3.2 The utterance as instruction – obeying the instruction

In what follows I attempt to outline the conceptual and actional work of an actor/cognizer from hearing an utterance to having built up a conceptualization (plus attribution) of that utterance. I will use a single example by which the general mechanisms will nevertheless be

considered. The example chosen is that from sections 1.3 and 2.2.4 in Part I. It is repeated here as (4.40).

(4.40) The three-year-old twins Jessica and Nicole are at dinner with their parents Sarah and Marc. Nicole reaches for the milk carton. She grips it only with her fingertips, causing it to fall down. It falls off the table and runs all over the floor. Jessica and her mother have kept track of what happened.

(a) Jessica: *Nicole hat die Milch runtergeworfen*.
Nicole.3NOM have.3AUX the.ACC milk down-throw.PTCP
'Nicole knocked over the milk.'

Sarah: (hesitating, looking at the surprised causer)

(b) *Nein, sie ist ihr runtergefallen*.
No it.3NOM be.3AUX her.DAT down-fall.PTCP
'No, (it happened to her that) it fell down.'

Jessica: … (not signalling misunderstanding)

Jessica's and Sarah's utterances are verbalizations of what they have just perceived. My specific proposal is that they have arrived at similar conceptualizations of the sensed circumstance, where their attributions then diverge (see section 3.2). In what follows I will "vivisect" their cognitive activities using the theoretical notions developed throughout this work. The overall strategy is viewing an utterance as an instruction to simulate a perception, made possible by the regular mapping between conceptualization and syntactic structure outlined in sections 3.3 and 3.4. The interpretation activities described below can be viewed as happening from the perspective of one of the above interlocutors, or from your perspective as a reader. In the first case the utterance is an instruction for a re-evaluation of what has just been perceived, in the latter case it is an instruction for a conceptualization in the absence of a percept. Consequently, the instruction is formulated as an instruction to the interpreter.[178]

Step (1): Establish the overall setting by making use of the grammatical information (word category, person and agreement information) in the uttered (in a step-by-step manner) material.

(a) Build up a conceptual field (as a simulation of a visual field).

(b) Determine your relation as conceptualizer and the relation of the speaker relative to the circumstance coded by the utterance (egocentric vs. allocentric space).

Jessica's utterance:

[178] In what follows interpreter, perceiver, and conceptualizer are used interchangeably.

Step (1) concerns the relationship between the interpreter and the circumstance coded by the utterance, as it is built up through the utterance. Any perceptual event, either real or simulated, involves a viewer whose visual field encloses a limited number or amount of stimuli (1a). Secondly, what happens in the environment in the visual field can either involve the interpreter or speaker in that it is spatially related to him/her or both (egocentric space) or it may be independent of him/her or both such that stimuli are spatially related only to one another (allocentric space).
The overall setting of the circumstance coded is such that the interpreter decodes it as taking place allocentrically. In other words, because of their forms (3rd person NPs) Nicole and the milk are specified relative to each other but not to the conceptualizer. This is depicted in Figure 4.33.

Sarah's utterance:
– see Jessica's utterance –

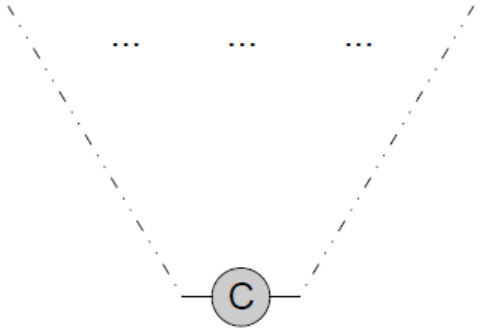


Figure 4.33: Establish the overall setting

Step (2): Identify object (NP) and circumstance (V, P) expressions and conceptualize referents in dependence of the order in which expressions are uttered/heard.
(a) Identify object expression(s) (NPs) and evaluate the features and affordances of the referent object(s).
(b) Identify circumstance expression (V, P) and extract the features and affordances of the objects that constitute it.
(c) Determine the construction underlying the utterance (see last section for the most important construction types in German).
(d) Try to establish the regular conceptualization-syntactic structure mapping in accordance to diagrammatic iconicity (see section 3.3).

Jessica's utterance:
Step (2) has to take place on basis of the same expressions as step (1), namely NP and V. Nevertheless, it cannot be completed until the establishment of the overall setting. In particular, the interpreter sequentially encounters the NP *Nicole*, the verb *hat*, the NP *die Milch*, and the participle *heruntergeworfen*. This is then an instance of a (bare) NP-V-NP construction (leaving case and agreement morphology open for now). *Nicole* refers to an animate human being that affords movement (i.e., self-

initiated activity) and exertion of force in any human-like manner (going, rolling, diving, pushing, pulling, grasping, bumping etc.) and in any direction that the human body allows (either moving as a whole or being stationary, moving only limbs), and she is in principle competent of action.

Hat is unambiguously a verb because of its form; it is ambiguous between a lexical possession verb and an auxiliary. Ignoring tense and aspect here,[179] both possible functions of *hat* involve aspects of activity/process, the latter potentially even responsibility (cf. Keller & Sorace 2003 and section 4.4.2). Note that circumstances are constituted by nothing but objects. A circumstance expression is the instruction to conceptualize some object in the first instance at which the circumstance can constitute itself. So the conceptualization of *hat* is possible only on the basis of the conceptualization of at least one object. This object ideally affords movement (activity) or motion (process) and possibly exertion of force, if *hat* is identified as an auxiliary, or it necessarily affords possession (i.e., holding something, see section 3.3.2), if it is identified as a lexical verb. *Milch* might refer to an individuated object or some non-individuated mass (i.e., location). The determiner points to the former, i.e., to a delimited mass, making it an object (which might nevertheless function here as a location landmark). *Die Milch* then metonymically refers to a glass or carton filled with milk and affords only externally caused motion in manners that its physical makeup allows (lie, stand, fall, drain off, drink etc.) and in directions in which it is caused to move. It also affords exertion of force if it is itself causally affected. The final complex verb form (indicated by the *-ge-...-en* form with attached prepositional adverb) instructs the interpreter to conceptualize a circumstance in which a movable object moves away from another movable object that must afford exertion of force and most probably lexically required responsibility. This verb lexicalizes the trajector of the circumstance as PSC (which corresponds to the regular mapping established in section 3.3). The affordances of the involved objects and the instructions that the circumstance expressions make are given in Figures 4.34a to 4.34e below.

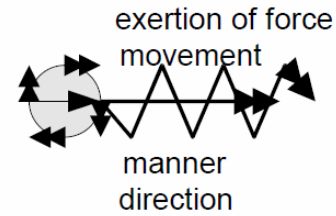


Figure 4.34a: Affordances of Nicole

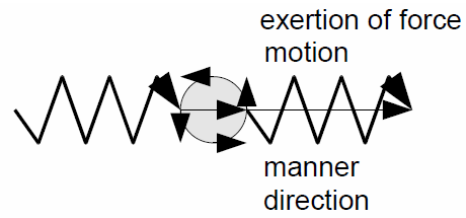


Figure 4.34b: Affordances of the milk

[179] Tense is not the topic of this book. Aspect is discussed in connection with objects, specifically with landmarks (see sections 3.4.6, 3.4.7, and 3.4.8 for details).

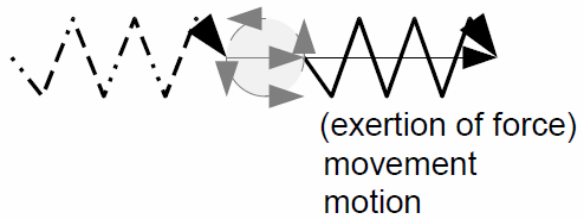


Figure 4.34c: Instructions coded in hat *(auxiliary)*

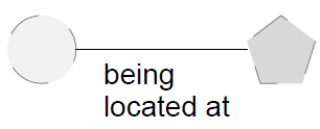


Figure 4.34d: Instructions coded in hat *(lexical verb)*

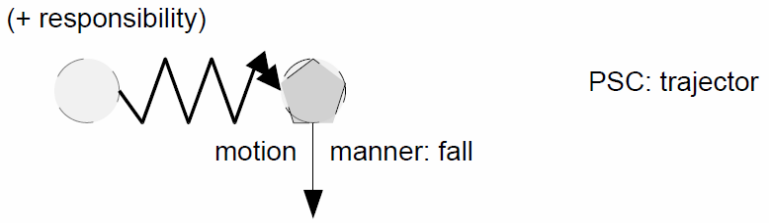


Figure 4.34e: Instructions coded in heruntergeworfen

The schematics for the circumstance expressions contain shaded and dotted trajector and landmark symbols. This indicates the primacy of objects in conceptualization. The respective circumstance cannot be conceptualized without conceptualizing objects first. However, it can already be seen in the above Figures that it is the objects that are candidates for exactly these roles, as those objects at which the circumstances constitute themselves.

Sarah's utterance:
The interpreter does nearly the same things as in Jessica's utterance. What is different is the order in which he/she encounters the phrases, the pronoun forms for the full NPs, and the lexicalization of the motion pattern by means of *heruntergefallen* and *ist*. The difference between *heruntergeworfen* and *heruntergefallen* is that of causativization. While the former verbalizes a circumstance with a (responsible) causer, the latter does not necessarily. The auxiliary *ist* is less likely to code a causative circumstance but more likely to code a complex circumstance (cf. Keller & Sorace 2003 and section 4.4.2). The copula instructs the interpreter to specify some feature or location of an object. The circumstance concepts are given in Figure 4.35a to 4.35c.

Figure 4.35a: Instructions coded in ist *(copula)*

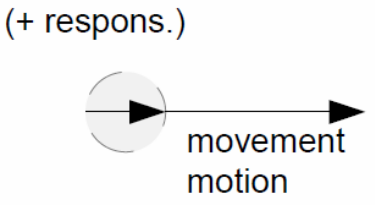


Figure 4.35b: Instructions coded in ist *(auxiliary)*

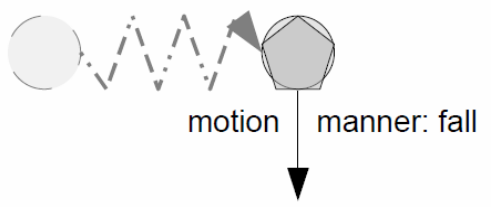


Figure 4.35c: Instructions coded in heruntergefallen

Step (3): Link parts of the conceptualization to parts of the construction.

(a) Identify mutual affordances of involved objects.

(b) Distribute trajector and landmark (predictively, incrementally) using any available clues: mutual affordances of the objects, lexicalization type of the verb (trajector or landmark as PSC), formal cues (construction, phrase order, agreement and case morphology), non-formal cues (animacy, individuation, person, empathy; in short: enact RCP).

(c) Conceptualize spatio-temporal circumstance between trajector and landmark objects and link them to object and circumstance expressions in the construction.

(i) Identify nominative case on the object being PSC, using information about the verb's lexicalization type and the trajector/landmark distribution of the present circumstance.

(ii) Identify accusative case on the other object, if it stands in a relation of non-directional or uni-directional fictive or concrete motion/movement to the PSC trajector/landmark.

(iii) Identify dative case on the other object, if it stands in a relation of asymmetric or symmetric bi-directional or coincident directional fictive or concrete motion/movement to the PSC trajector/landmark and/or in a relation of internal actional involvement to the whole circumstance (see section 4.1.6.2).

(iv) If there are prepositional, incorporated, particle, or adverbial path or location expressions, they govern the case of the respective landmark expression;

- the path expression governs dative case in simple relations (*jmd. wohnt unter der Brücke* 's.o. lives under the bridge.DAT'),
- the path expression governs dative case in complex relations with verbs lexicalizing landmarks as PSCs, where the dative bearer is starting point of the path (*jmd. bekommt etw. von jmd*. 's.o. gets sth. from s.o.DAT'),
- the path expression governs accusative case in complex relations with verbs lexicalizing trajectors as PSCs, where the accusative bearer is end point of the path (*jmd. schickt etw. an jmd*. 's.o. sends sth. to s.o.ACC').

(d) Predict minimal constructions (Make your conceptualization as parsimonious as possible).

(e) Maximize prediction (Use any cue at any moment in order to be maximally accurate in your prediction).[180]

Jessica's utterance:
Predicting minimal constructions and maximizing predictions, the interpreter will predict a simple monadic activity when encountering *Nicole* and continue to do so when encountering *hat*, interpreting this as an auxiliary, e.g., *Nicole hat getanzt* 'Nicole danced'. Interpreting *hat* as lexical verb would violate the minimal construction principle (since it requires another object). Encountering *die Milch* leads to a modification of the prediction of *hat* as auxiliary. The isolated affordances of Nicole and the milk are now reduced to the mutual affordances that hold exclusively between Nicole and the milk: The options for monadic activities and processes fall away. The simplest circumstance between both would then be that of the one having the other. *hat* would then be treated as a lexical verb meaning 'have at one's disposal'. This verb lexicalizes the landmark as PSC. Other, less simple options would be one object moving to or causally affecting the other one. Even less simple would be circumstances like those discussed in the dative sections (those of bi-directonal motion/movement or internal actional interest). In both cases *hat* would be treated as auxiliary. The question is then which of the mutual affordances is actualized. Formal and non-formal cues could help maximize the prediction.

	phrase order	**possible case category**	**agreement (verb: *hat* have.3SG)**	**first complement (PSC preference)**
Nicole **Nicole.3SG**	free	nom, dat, acc	possible	yes
die Milch **the milk.3SG**	free	nom, acc	possible	no

Table 4.2: Formal cues in Nicole hat die Milch… *'Nicole has (...) the milk (...)'*

Obviously, formal cues are not informative here (case syncretism, ambiguous agreement, free phrase order) as to which circumstance holds between both objects and which is the trajector/landmark distribution. (Note that the construction is already exploited as a formal cue at this point in that it has already caused the reduction of two isolated affordance evaluations to the evaluation of mutual affordances between the two objects. The phrase type in which the noun expression occurs – NP or PP – can only serve as a cue here in a restricted sense, since there is no PP. All nouns will thus be excluded as landmarks of motion/movement paths). Only the fact that Nicole is the first phrase may lead to the prediction of its being the PSC. Employing non-formal cues, then, it turns out that all scale information point to

[180] See Newmeyer's (2002) commentary on Hawkins (2002). Newmeyer claims that there are two possible interpretations of Hawkins's "Maximize On-line Processing", only one of which involves prediction of what is yet to come. It is this interpretation which is crucial for my own proposal. The importance of prediction is also emphasized by Primus 2002 and is central part of neurolinguistic theories of sentence comprehension (cf. Bornkessel & Schlesewsky's (2006 and subsequent "extended Argument Dependency Model (eADM)").

the fact that Nicole is the object that ideally closes the circumstance at the front end. This is illustrated in Table 4.3:

animacy	**human**	**non-human animate**	**inanimate**	
Nicole the milk	x		 x	
individuation	**individuated**	**non-individuated**	**abstract**	
Nicole the milk	x x			
person	**referent of I**	**referent of you**	**other referents**	
Nicole the milk			x x	
empathy	**self**	**kin**	**person**	**others**
Nicole the milk			x	

Table 4.3: Non-formal cues in Nicole hat die Milch… *'Nicole has (...) the milk (...)'*

Respecting formal and non-formal cues, and predicting minimal constructions, Nicole will then be interpreted as possessor of the milk and thus the landmark and PSC (yielding *Nicole hat die Milch.* 'Nicole has the milk.'), in accordance to the exceptional but motivated instructions of *hat* (PSC is landmark).[181] *Nicole* is therefore identified to bear (morphologically null) nominative case. This fits also the affordances of the milk as a movable object that finds its place in space through movements of persons. The milk in this circumstance does not satisfy the conditions on bearing dative case but that for bearing accusative case. So *die Milch* is identified as bearing accusative case. Not predicting *Nicole* but *the milk* to be the PSC leads to the cognitive disadvantage that the interpreter must predict further lexical material, since the milk having Nicole is not a possible circumstance. The incremental conceptualization is thus the one in Figure 4.36.

[181] In principle, the intonational contour of *Nicole hat die Milch* may indicate whether this utterance is finished after *Milch* or not. A falling intonation contour on *Milch* would indicate the end of the utterance and thus the possessive meaning. But crucially, the possessive construction need not have a falling intonation because it could be complemented by an adverbial phrase like *schon wieder* 'again'. This is the reason *Nicole hat die Milch…* can be (falsely) predicted to be a possessive construction in incremental interpretation, although it does not exhibit a falling intonation on *Milch*.

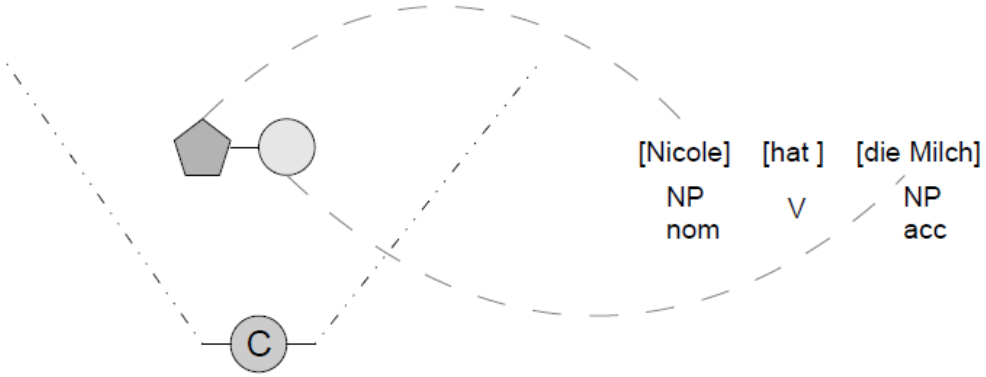


Figure 4.36: Nicole *predicted to be landmark PSC and* die Milch *'the milk' to be accusative trajector of* hat *'has' as lexical verb, yielding* Nicole hat die Milch *'Nicole has the milk'*

When encountering *runtergeworfen*, the concept must be fundamentally modified. The verb instructs the interpreter to conceptualize a (responsible) causer/mover trajector as PSC. While formal cues remain uninformative, only Nicole affords movement and exertion of force against something in order to make it move downwards – which is the motion pattern the verb instructs the interpreter to conceptualize. Reanalysis of *hat* as auxiliary could also point to Nicole as the object exerting force, i.e., being the PSC of *hat,* due to her non-formally induced high prominence. The only trajector candidate in this circumstance is thus Nicole who perfectly satisfies the RCP. Reanalysis requires a new trajector/landmark distribution in relation to the possessive relation formerly predicted, then. The result is the conceptualization in Figure 4.37. The motivation of *die Milch* for bearing accusative case has now changed from a non-directional relation with *hat* as the lexical verb to a uni-directional relation with *runtergeworfen* as the lexical verb.

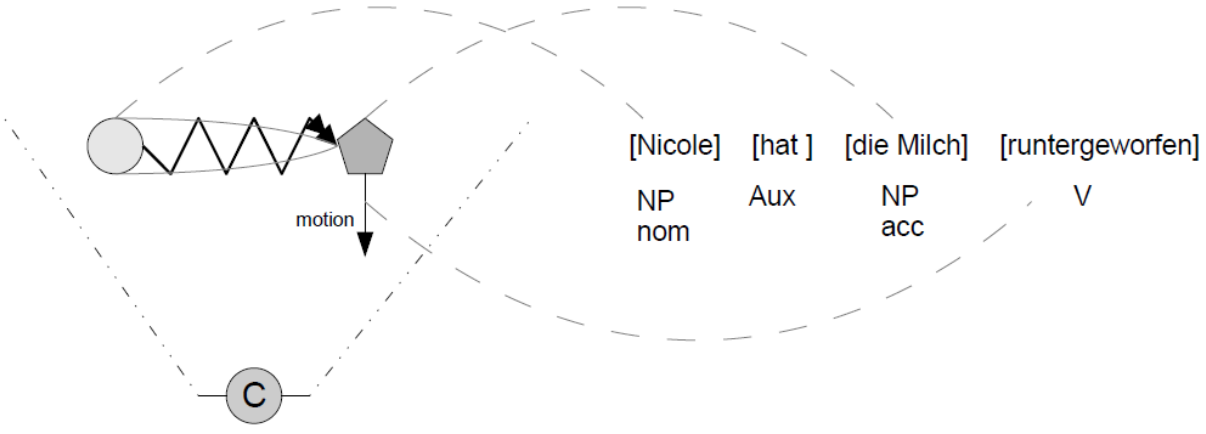


Figure 4.37 Nicole *conceptualized to be trajector PSC and* die Milch *'the milk' to be accusative landmark of in 'knocking over' circumstance, yielding* Nicole hat die Milch runtergeworfen *'Nicole knocked over the milk'. Note that two sub-parts are compressed here in one schematic, namely that of Nicole exerting force against the milk and that of the milk falling down.*

Sarah's utterance:
Encountering *sie*, which is ambiguous between being coreferent with *Nicole* or *die Milch* and between nominative and accusative case, the interpreter will strive at closing the circumstance as fast as possible, thereby enacting the RCP. He/she will thus interpret *sie* as nominative, PSC and referring to Nicole (topic continuity may also play a role here) and predict it to be involved in a simple monadic circumstance involving activity in which Nicole can in the optimal case be attributed responsibility (see Jessica's utterance for an example). When encountering *ist*, this prediction can be maintained only partially. The interpreter can either switch to a circumstance which does not involve movement and responsibility (predicting a predicative construction coding some featural specification of Nicole, like *Sie ist müde* 'She is tired'), in which Nicole remains nominative PSC and closes the circumstance less satisfyingly; or the interpreter predicts a more complex and/or dyadic circumstance and construction (like *Sie ist aufgestanden* 'She got up'), allowing him/her to further treat Nicole as responsible mover. Whatever the interpreter chooses to do, he/she will have to modify his/her conceptualization when encountering *ihr*. Assuming the dative complement is not an ancient form (like in *nähern* 'approach', coding an Indo-European locative) but a synchronically motivated one like those discussed in section 4.1.6.2, it is very likely to have an animate referent in order to exhibit fictive or concrete motion/movement and/or being actionally involved in the circumstance. This featural requirement cannot be satisfied by the milk. The circumstance will thus be reanalysed towards one in which *sie* bears nominative case and refers to the milk, is PSC, and moves towards the dative referent, now identified as Nicole, which moves either against the motion of the milk carton or is internally actionally involved in the circumstance of the milk carton in terms of goals and interests. I would assume the prediction is one in which Nicole is physically involved, since this increases the chances of the interpreter to have the circumstance closed in accordance to the RCP. In any case the interpreter will now expect a simple dyadic relation – the most parsimonious prediction. This prediction must again be dismissed when encountering *heruntergefallen* which codes a complex monadic relation. However, the interpreter has encountered two complements already, and is now forced to identify the trajector of the falling circumstance as the milk – because of its nominative case marking which overrides non-formal cues. The dative referent can now be conceptualized – in accordance to the dative discussion above – as one who causes the falling of the milk by exerting force against it, but where this causation opposes her current goals or interests. Spatio-temporally, this conceptualization differs from the one underlying Jessica's utterance only in terms of vantage point. It is given in Figure 4.38. (Note that the milk is the trajector in the falling event but the landmark in Nicole's exerting force against it. Figure 4.38 compresses these two sub-parts of the circumstance, such that the milk is depicted here only as landmark.)

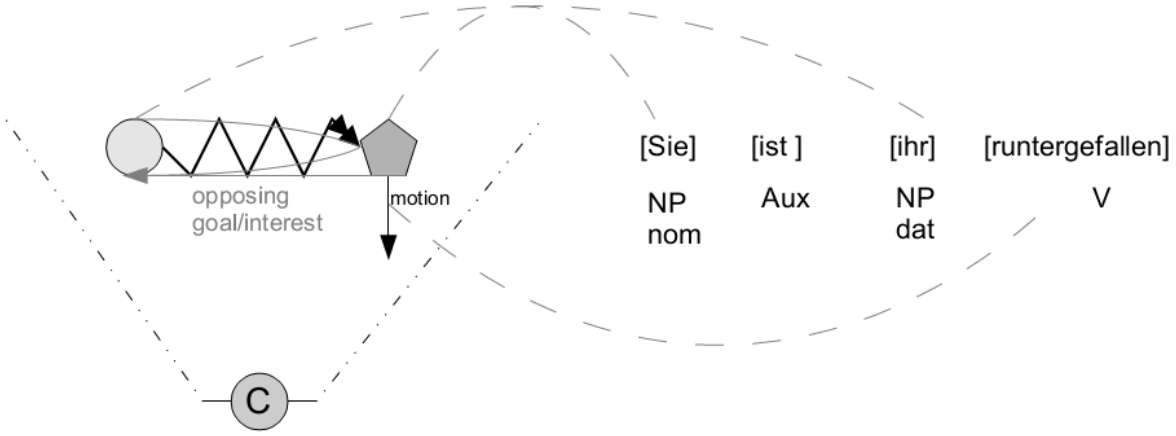


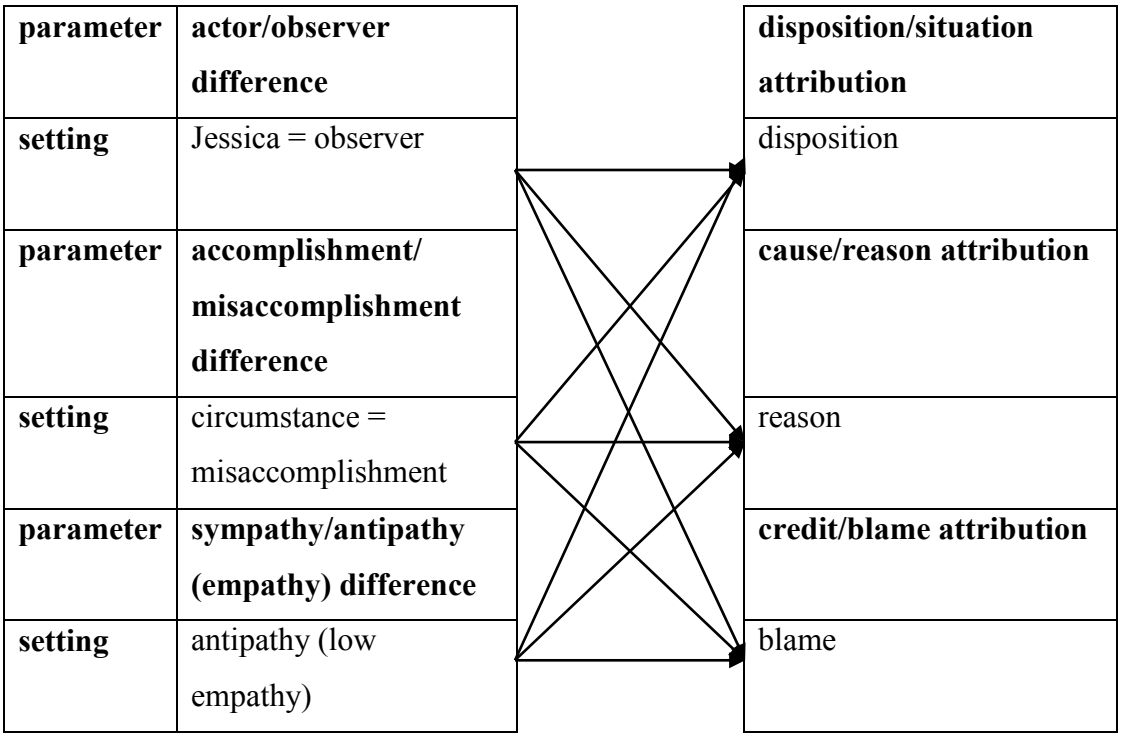
Figure 4.38: Conceptualization of Nicole *as internally actionally involved trajector and of* die Milch *'the milk' as accusative landmark of 'knocking over' circumstance, yielding* Nicole hat die Milch runtergeworfen *'Nicole knocked over the milk'. Note that two the two sub-parts of this whole circumstance are compressed here into one schematic, namely the sub-part of Nicole exerting force against the milk (where the milk is landmark) and that of the milk falling down (where it is trajector).*

Although the interpreter employed different strategies in incrementally conceptualizing circumstances from the two utterances, he/she has arrived at spatio-temporally identical conceptualizations. If this was the whole story, the verbal interaction above would be quite strange, since both utterances were options of one another, making Sara's objection to Jessica's utterance inadequate. However, the central claim of the present proposal is that this is not the whole story. It has been argued extensively in section 3.2 that conceptualizations as simulated perceptions are underspecified with respect to certain parameters, especially actional ones concerning attribution. The above dialogue is thus the paradigmatic case of a single percept, spatio-temporally similar concepts but two verbalizations with nevertheless different semantics (i.e., conceptualization plus attribution) which are both potentially appropriate utterances, given some non-objective conditions are satisfied.

Step (4): Make attributions in accordance to the attributional praxis you are participating in.
(a) Check whether attributions are lexically enforced. If yes, re-enact the attribution.
(b) If it is not lexically enforced, evaluate the attribution by yourself.
(i) Identify the objects with respect to which attribution is available.
(ii) Identify the parameter setting of the determining and determined parameters (see section 3.2 for details).
(iii) Attribute responsibility or refrain from attributing responsibility by means of imposing it on the spatio-temporal conceptualization of the circumstance in question.
((c) After having re-enacted the attribution, having obeyed (a), re-evaluate it by obeying (b (i) to (iii))).

Jessica's utterance:

In this circumstance, Nicole is the only object of conceptualization that can also be an object of attribution. In Jessica's utterance attribution of responsibility indeed seems to be lexically enforced, i.e., the PSC of *runterwerfen* is most likely a responsible causer. The interpreter is thus forced to re-enact this attribution, since this is a precondition for understanding the utterance.
The interpreter has only insight into the result of the Jessica's attribution (the verb *runtergeworfen*), but not into the parameter setting by which she was led to make it. Knowing each other well might make this possible. Given that Jessica and Nicole are twins, the parameter setting in Jessica's attribution could have been the following, i.e., Jessica could have closed the circumstance in question in the following way.



→ This parameter setting corresponds to scenario F from section 3.2.3.

The person involved in this circumstance is attributed responsibility for what he/she has brought about.

Figure 4.39: Attribution in the utterance Nicole hat die Milch runtergeworfen

However, after having re-enacted Jessica's attribution (perhaps even after being able to anticipate it, if the verb is encountered earlier), the interpreter can re-evaluate it, if he/she has witnessed the event that underlies it, too, or knows about it due to other sources. The former holds true for Sarah in the situation presented in (4.40)). Her utterance is the consequence of an attribution performance different from that of Jessica (thus the *nein* 'no' with which her contribution begins).

Sarah's utterance:

Trivially, Nicole is again the only object of conceptualization that can be attributed some actional matter. The parameter setting in attribution is the following, i.e., Jessica could have identified the circumstance in question in the following way:

parameter	**actor/observer difference**	**disposition/situation attribution**
setting	Sarah = observer	situation
parameter	**accomplishment/ misaccomplishment difference**	**cause/reason attribution**
setting	circumstance = misaccomplishment	cause
parameter	**sympathy/antipathy (empathy) difference**	**credit/blame attribution**
setting	sympathy (high empathy)	no blame

→ This parameter setting corresponds to scenario D from section 3.2.3.
The person involved in this circumstance cannot/is not attributed responsibility for what he/she has brought about.

Figure 4.40: Attribution in the utterance Sie ist ihr runtergefallen

Looking back to (4.40), the last turn in this verbal interaction is that of Jessica not signalling misunderstanding regarding Sarah's correcting utterance. What Sarah has done with her utterance is confirming Jessica's spatio-temporal conceptualization implicitly, while disagreeing with her attribution performance, namely by leaving the spatio-temporal structure of the conceptualization untouched but imposing a different attribution onto it. Jessica's re-action signals that she has understood this (though she need not necessarily have accepted it). Jessica and Sarah can now believe to have understood each other.

4.3.3 The utterance as instruction – building up the instruction

In this section I will describe the activities of an actor/cognizer from the perception of a circumstance to its verbalization. I will do this by means of a picture story.

(4.41) You are sitting on a bench inside the train station of your home town waiting for a train. Across from you a woman is standing in front of the wall, reading a book. From overhearing her speaking with an employee of the railway company you know that her

name is Therese. A woman you do not know is standing beside her. You then observe the following (see picture story). Later you tell your friend what you have seen.

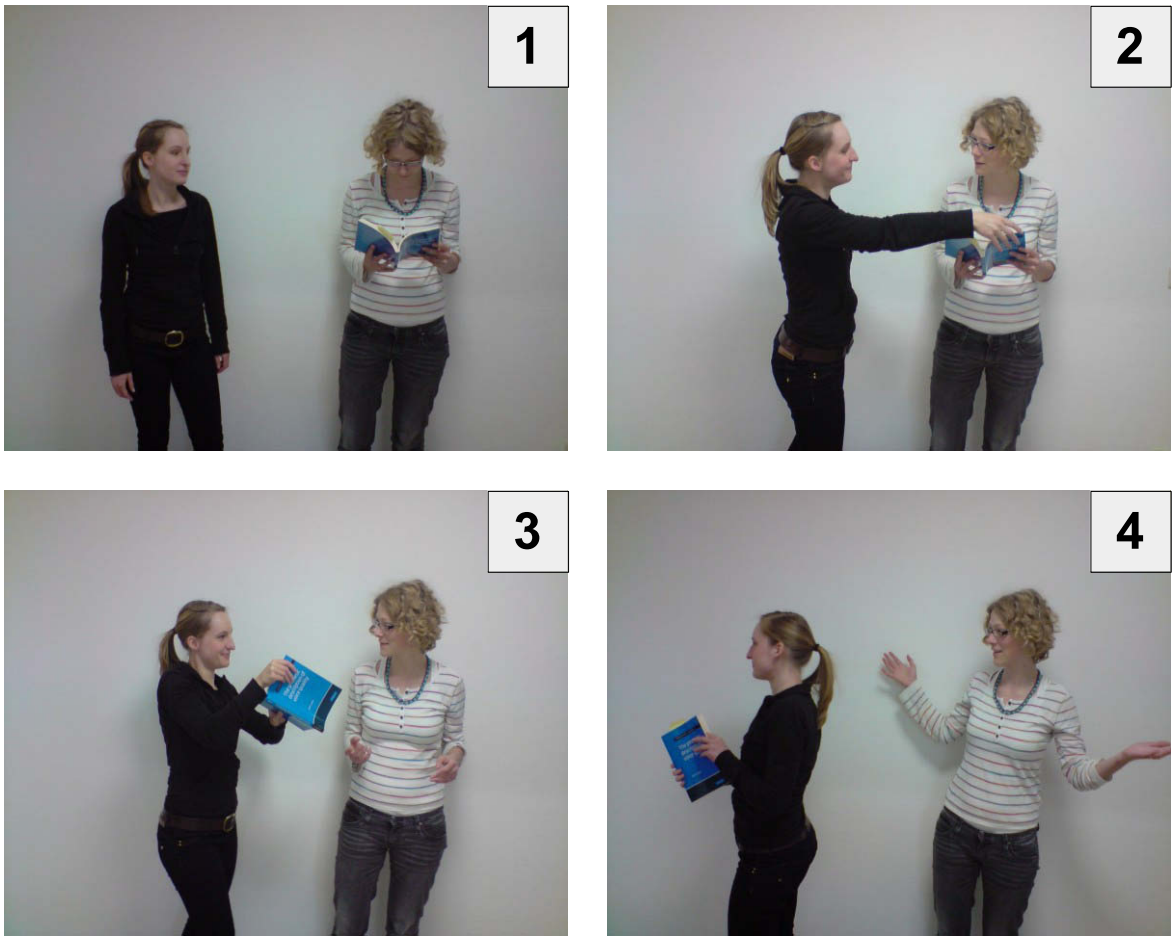


Figure 4.41: Picture story

Step (1): Build up a percept of the stimuli in the visual field.
(a) Integrate visual features into objects.
(b) Determine figure/ground structure.
(c) Determine your relation as perceiver to what happens in your visual field (egocentric vs. allocentric space).

There are several visual features already in the first picture that allow a perceiver to integrate them into three different objects. Listing three of them shall suffice here: first of all, there are color cues (the dominating dark colors of the object on the left side, the different bright colors of the object on the right side, the blue color of the third object of which it is not immediately clear whether it belongs to the object on the right or whether it is an object itself). Secondly, there are clear edges that even on the two-dimensional retinal image that allow separating at least two objects from one another and from the background. Thirdly, there are movement/motion cues. In contrast to the background the two different, larger shapes are not immobile but move slightly even when standing. The third, small object may even move faster than the more inert bodies of the other objects.

That means in sensing the circumstance that is statically depicted in the first picture a perceiver can detect several features that are still disintegrated. It is the gestalt laws that help integrate them. The integration of features into objects also includes the separation of a figure from a ground. It is especially the law of good continuation that suggests that the disintegrated features on the left make an object, although it exhibits different colors. The same can be said about the features on the right. Between the two there is no good continuation, so that they are not recognized as a single object. Both objects also exhibit closure (there are no gaps in them) and common fate, i.e., if some of their features are involved in motion/movement, all of them move more or less. It is perhaps the not-so-good continuation and the only "partially" common fate of the third, small object that already allows a perceiver to segregate it as a unique object from the large one to the right with which it is featurally intermingled. Information from motion parallax could also contribute to its singling out as an object.

Depending on where the perceiver looks, there are different figure/ground configurations possible. He/she may single out each one of the objects from the background. Whether some specific figure/ground segregation is predominant for the perceiver does not turn out until "something happens". This is the case in the three further pictures where, broadly speaking, the black object moves towards the bright and small objects at the same time such that the latter become the ground in relation to which the former moves. This is depicted in Figure 4.42 below. Furthermore, the perceiver is not physically involved in what he/she perceives. He/she perceives what is happening in his/her visual field as relations only between the objects he/she has recognized. As such, this happens in allocentric space.

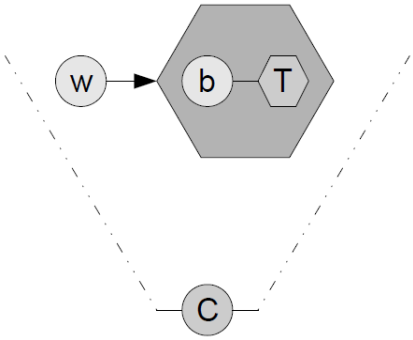


Figure 4.42: Build up a percept of the stimuli in the visual field (w: woman in black; b: book; T: Terese)

Step (2): Identify stimuli in the visual field. (a) Evaluate features and affordances of the objects recognized (on-line). (b) Evaluate mutual affordances of the objects recognized (on-line). (c) Identify spatial structure of the circumstance in terms of trajector and landmark. (d) Identify temporal structure of the circumstance. (e) Determine causal structure of the circumstance.

After having built up a bottom-up structural description of the stimuli from the retinal image, the stimuli can be identified/categorized by means of top-down processes. The two larger objects can easily be identified as human beings, since their percepts, i.e., mainly their shapes and their movements, are similar to available concepts of human beings. The third object can probably without effort be identified as an instance of a book.

Concerning their affordances, human beings are able to move by themselves in various manners, they may exert force on objects by pushing, pulling, grasping, throwing, they may hold things, let go of them, and so on. Books do not afford movement by themselves; if they move, it is externally caused. Being determined by its features, the book can be opened, rotated, thrown, held, torn, flipped open, and so on; they can fall, lie, and stand under certain conditions; they may exert force on other objects, if they are moved (see section 3.2.1.2 on affordances).

All the objects in the visual field are restricted in their states, processes, and activities by their features. When the woman in black turns towards Terese, and commences to reach out her arms (picture 2), the perceiver calculates what will happen next. His/her object knowledge in terms of affordances aids him/her. Because the actual and possible circumstances in his/her visual field, and especially those of the person moving now stops being a monadic one, mutual affordances come into play. Although the woman in black is apparently reaching towards the superordinate object ground/landmark, the affordances of the book and Terese each get "mutualized" because they are two objects standing in an actually alienable part/whole relation. Depending on the progress of the movement, the mutual affordances between the woman in black and Terese with the book or between the woman in black and the book are perhaps of the following kind: taking the hand (for greeting or leading Terese somewhere), pushing, pulling, hitting, taking something, fondling and the like. It does not afford some giving activity, since the woman in black has no object that has been identified and that could be given to someone. At the same time Terese – although affording giving sth. to s.o. in principle – does not intend to give the book away. Thus, the progress of the movement of the woman in black actualizes the affordance of taking, as picture 3 shows, thereby inhibiting Terese's activity of holding the book. Furthermore, this determines the book as the ground to the black woman's activity. In its relation to Terese, the book is at the same time a figure, Terese being its ground. Finally, the woman in black has (holds) the book and goes away from Terese. It is – except the movement of the woman in black – the reverse figure/ground configuration from the beginning.

The temporal structure of what has happened in the visual field of the perceiver cannot easily be determined. Earlier (section 3.4) it has been argued that the temporal structure of a circumstance can be characterized on a sensational, conceptual (concerning identification), and actional/attributional level. Although all sub-part boundaries on the highest level (attribution) correspond to sub-part boundaries on the lowest level (sensation), the reverse is not true. I will confine myself here to circumstance sub-parts on the conceptual and actional levels because it is them that are important for linguistic^{o} coding. That means fixing the temporal structure of the

circumstance on the attributional level anticipates crucial aspects of step 3 concerning attribution. They are depicted in Figure 4.43.

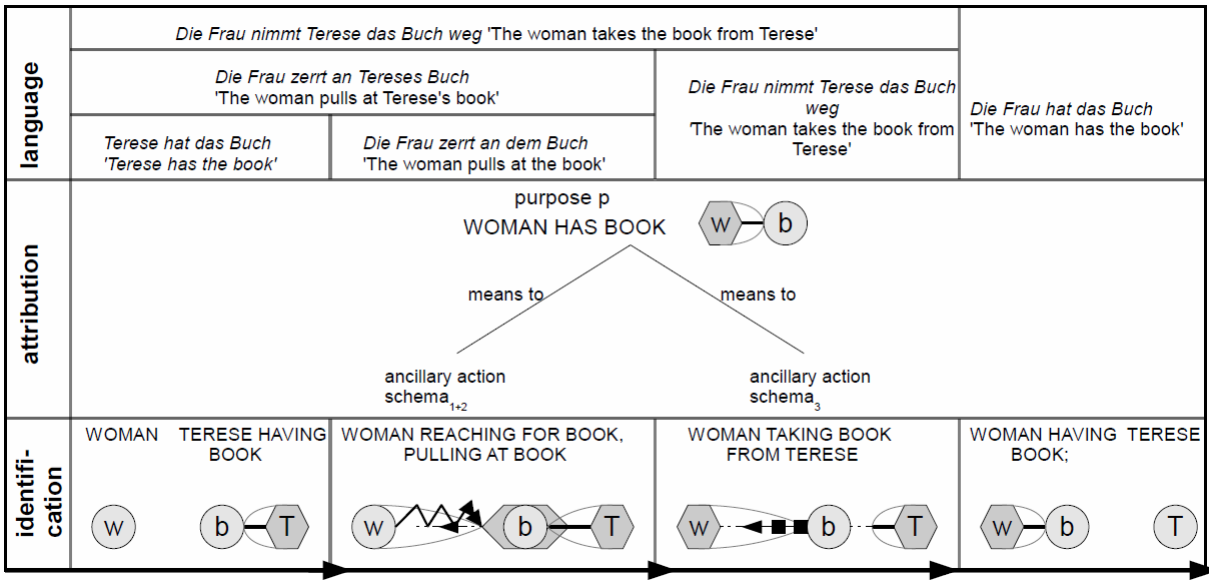


Figure 4.43: Aspects of the temporal structure underlying circumstance in picture story

Even on the conceptual level one can identify several sub-parts of the circumstance. I have depicted four in Figure 4.43. The first and last illustrate the initial and final situations. The second panel illustrates the movement of the woman (w) towards the book (b) and the pulling activity. Strictly speaking, these can be identified as two action schemas. The third panel illustrates the movement of the book away from Terese (T) towards the woman in black by means of pulling. On the actional/attributional level it is the activities of the woman in black in the second and third panel that are identified as means to the purpose of having the book which is put into effect in the end. The reaching for the book, the pulling at the book and taking the book are the three ancillary action schemas that the woman is attributed as actualizing in order to have the book. (For reasons of space the two first action schemas have been compressed into the second panel. The language level, though anticipating what is yet to come, illustrates that each sub-part of the circumstance may be expressed by separate utterances; see section 3.4.6)

Concerning the causal structure of the circumstance, it is certainly the case that the reaching for the book by the woman and the motion of the book towards her are spatially and temporally contiguous and that contact between the two is perceived. These are the primary cues that are involved in identifying a causal relation (see section 3.2.1.3).

Step (3): Make attributions in accordance to the attributional praxis you are participating in.
(a) Identify the objects with respect to which attribution is available.
(b) Identify the parameter setting of the determining and determined parameters (see section 3.2 for details).
(c) Attribute responsibility or refrain from attributing responsibility by means of

imposing it on the spatio-temporal conceptualization of the circumstance in question.

There are certain circumstances in which humans are involved that are judged differently depending on particular parameters (see section 3.2), for instance those where something gets broken and where it is debatable whether someone can be attributed responsibility for the result or not. The circumstance depicted in Figure 4.41 is not of that kind. In the sociocultural and attributional praxis where such circumstances take place, no one would exonerate the woman in black from the responsibility of having taken the book from Terese. It is obvious that she could have desisted from doing so and that there is a purpose in her deed, namely taking possession of the book. The determining and determined parameters in attribution are the cues that are taken into account where matters of responsibility are unclear in the first instance. It is thus clear that the woman in black is attributed responsibility.

Step (4): Verbalize the circumstance
(a) Choose construction in dependence of steps 2 and 3.
(b) Choose mapping type (iconic to circumstance vs. iconic to scanning).
(c) Decide on taxonomic level of object and circumstance expressions.
(e) Decide on coding agentivity lexically in the verb.
(e) Assign case and agreement.
    (i) Determine PSC.
(f) Choose phrase order.
    (i) Respect RCP.
(g) Minimize constructions (Make your verbal contribution as constructionally parsimonious as possible).

Having discussed sensation, recognition, identification, and attribution, the circumstance must now be verbalized. There are several decisions to be made. There is firstly the construction. In dependence of the identification performances in step 2 there is obviously an adicity of 3 in the circumstance in question, i.e., it is three objects that make up the circumstance. That means a construction involving three NPs will be chosen for verbalization (in a regular, i.e., diagrammatically iconic mapping).

Although this is presumably mainly an information-theoretic matter, a mapping type must be chosen where available (see section 3.3 for details). The trajector-as-PSC variant has been discussed as exhibiting diagrammatic iconicity relative to the unfolding of the circumstance. The landmark-as-PSC has been discussed as being diagrammatically iconic with respect to the simulated eye gaze of the actor/cognizer. This will be chosen here. Because the PSC automatically agrees with the verb and bears nominative case, agreement need not be separately dealt with. The woman in black is the landmark in the pen-ultimate sub-part of the circumstance and will thus be realized as an NP bearing nominative case. It is her status which gives identity to the circumstance as a whole (see section 3.4.8). However, the nominative can be

motivated independently, namely by identifying uni-directional motion from the trajector to the landmark. At the same time this licenses accusative case for the NP designating the book (see section 4.1.6 on case).

The choice of a construction is not yet finished. Because there is a triadic construction it is not yet clear how the third object (Terese) is realized. Taking into account the fact that there is a path there in the circumstance, namely that of the book away from Terese towards the woman in black, there are two possibilities: an NP_{nom}-V-NP_{acc}-PP construction or a NP_{nom}-V-NP_{dat}-NP_{acc} construction. If the former gets chosen, the path would be coded by the preposition *von* 'from' and the NP would bear dative case because it is the starting point of a path (see section 4.2, step (3)). The construction choice has been shown to depend on the presence or absence of the criteria licensing the dative case form on the NP referring to Terese. Is there an instance of symmetrical or asymmetrical bi-directionality, of symmetrical or asymmetrical coinciding directionality, and/or (non-default) internal actional involvement (see section 4.1.6.2)? I would argue that there is internal actional involvement on the side of Terese: Taking the book from her obviously conflicts with her action planning which includes continuing reading. This alone can license the dative case. Secondly – what is rather worth discussing – one could argue that this is an instance of asymmetrical bi-directionality. Both women act towards the book, but with asymmetrical force which results in the succeeding of the activity of the woman in black. This also licenses the dative. Thus, we have an NP_{nom}-V-NP_{dat}-NP_{acc} construction.

A further question is which taxonomic level is chosen to code the objects and the circumstance. This is mainly an information-theoretic or discourse-related question. In brief, given both interlocutors know the information given in the text in (4.41), the woman in black is most likely to be referred to by something like *die Frau* 'the woman', Terese by *Terese* and the book by *das Buch* 'the book' (e.g., Ariel 1988, 1991). The verb must be one whose PSC is a landmark (in the penultimate sub-part of the circumstance which gives identity to the circumstance as identified and designated by the verb), and which codes the actualization of the mutual affordances outlined above. It either codes responsibility lexically or it must be inferred by a separate attribution performance on the side of the interpreter (see section 4.3.2, step (4)). A verb that satisfies these criteria and codes responsibility lexically, at least in its literal, i.e., motivated uses, is *wegnehmen* 'take from'. The resulting utterance and the complete linking schema are given in (4.42) and Figure 4.44, respectively.

(4.42) *Die Frau hat Terese das Buch weggenommen.*
The.3NOM have.3AUX Terese.DAT the.ACC book away.RSLT-take.PTCP
'The woman took the book from Terese.'

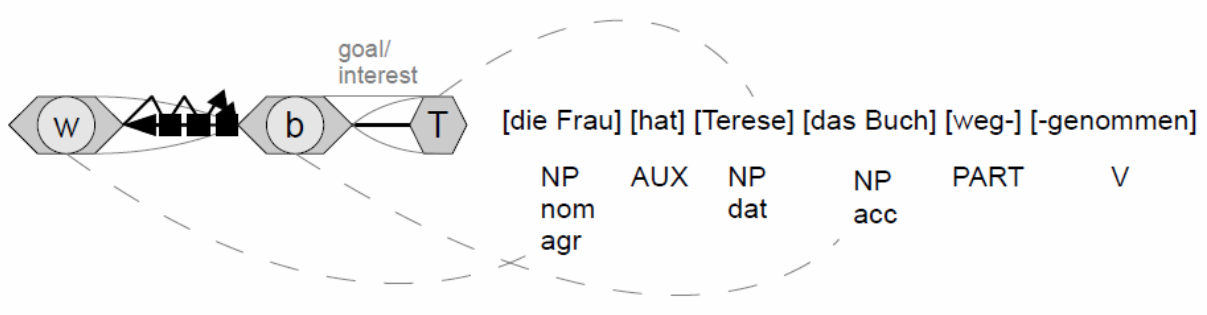


Figure 4.44: Linking schema for picture story in Figure 4.41

Although there might be interfering phonological, syntactic, information-theoretic, and discourse-related constraints (which are not the topic of this book), the utterance in (4.42) is in line with the RCP (see section 4.2). The responsible causer is realized as PSC, the secondarily active object is realized as a second NP and the least active object is realized as the last NP.

The maxim concerning the minimization of constructions can briefly be illustrated by means of Figure 4.43 again. The perceiver of the scene depicted in the picture story in Figure 4.41 could very well and in accordance with his/her sensation, identification, and attribution have verbalized this scene by means of multiple utterances, for instance by similar ones to those in the lowermost line in the language level in Figure 4.43. By not doing so he/she has obeyed the "minimize constructions" maxim. This maxim is motivated by cognitive efficiency (see section 3.2.1.4). By uttering (4.43) he/she allows the interpreter to simulate the perception of the scene in Figure 4.41. By uttering the several sentences from Figure 4.43 he/she would have accomplished the same thing but with far more effort.

4.4 Some German linking phenomena

- This section will demonstrate how the present framework deals with classical problems of the syntax-semantics relationship, in particular with what is called "argument structure" in other frameworks (see section 1.1). Some of these problems have already been dealt with in the context of particular actional, spatial- or temporal-conceptual matters, e.g., matters of aspect (section 3.4) and case (section 4.1.6) in a rather general manner. In this section, specific problems are discussed. This is given in Figure 4.45.

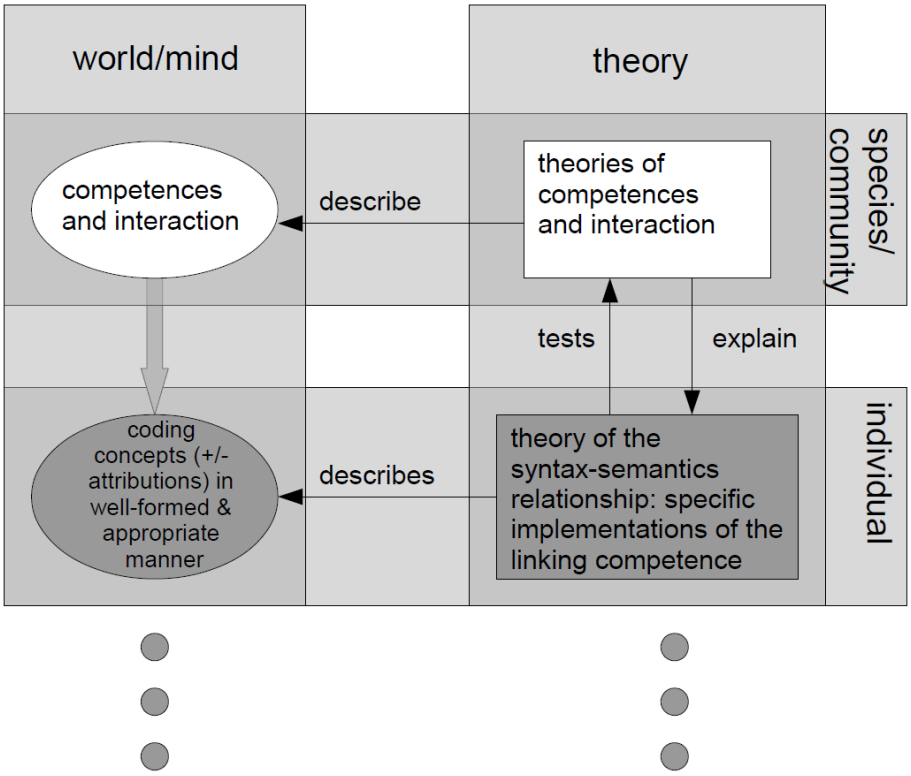


Figure *4.45: Coding concepts (+/- attributions) in a well-formed and appropriate manner as specific part of the linking competence that is developed in section 4.4*

Generally, the phenomena will be discussed from a semasiological perspective, looking at the sentences/utterances and asking why they have these forms and not others, why they cannot have these forms, and why they undergo some syntactic operation or not. Note that most of the phenomena are listed as they are known in the literature, even though the notions employed might not have a correlate in the present proposal.

4.4.1 "Unergative" versus "unaccusative" constructions

This distinction is based on the observation that the class of monadic constructions is not consistent but can be split into two subgroups, traditionally called "unergative" and "unaccusative" (cf. Perlmutter & Postal 1984 for the labelling and theoretical discussion; for discussion see also Fillmore 1968, Perlmutter 1978, Holisky 1987, Zaenen 1988, van Valin 1990, Levin & Rappaport Hovav 1995). Consider (4.43) and (4.44).

(4.43) *Es ist viel getanzt/ ??gestunken/#(hin)gefallen worden.*
It be.3AUX much dance.PTCP/stink.PTCP/fall.PTCP was.AUX.PASS
'There was much dancing./There was much stinking./There was much falling.'

(4.44) *Tanz!/ ??Stink!/ #Fall (hin)!*
Dance.IMP/Stink.IMP/Fall.IMP
'Dance! /Stink! Fall!'

The verbs in (4.43) and (4.44) code monadic circumstances, respectively. (4.43) shows what happens under impersonal passivization. While this is perfectly possible for *tanzen*, the conditions under which it is possible for (*hin)fallen* are pragmatically more restricted, and those for *stinken* are very specific. The same holds true for imperativization in (4.44).
Looking at the spatio-temporal conceptualizations underlying these circumstances, one finds that (*hin)fallen* codes a change of location in the trajector such that it takes a certain final position in space in the last sub-part of the circumstance. This is not the case for *tanzen* and *stinken* where the circumstances consist in only one (sub-)part, namely one of continuous movement, respectively. In the dancing and falling circumstances there is a trajector constituting the circumstance in that it actualizes one of its affordances. However, not everything affords movement/motion in a specific manner (*tanzen*), emission of bad odor (*stinken*) or free movement/motion downward (*(hin)fallen*). Movement/motion in a manner that is identified as dancing is an affordance mostly of humans, of few animals, and perhaps of leaves (in the wind). Stinking is unrestricted to a degree that few things attain. Virtually every object and even location can stink. Since odor in a sense moves away from the relatively stationary source, the origin of odor is a landmark. In contrast, locations cannot fall, however, but only things that can be detached from their present position. A summer house on a cliff affords falling but not a flatland summer house in a garden plot. These considerations are summarized in Table 4.4.

	object feature	**object affordances**	**spatial structure**	**temporal structure**
tanzen **'dance'**	making perceptual figure, animate	rhythmic motion/movement along circular path	monadic: trajector	simple
stinken **'stink'**	making perceptual figure or location landmark	emission of bad odor	monadic: object or location landmark	simple
(hin)fallen **'fall'**	making perceptual figure	free movement/motion downwards	monadic: trajector	complex

Table 4.4: Spatio-temporal requirements of objects involved in monadic circumstances listed

The consequence of the above observations is that not everything that can stink can also necessarily dance or fall. And not everything that can fall can also necessarily dance.
Looking at the attributional part of the semantics of the above utterances, one finds that attribution is possible only where animate beings are involved in the respective circumstances. So let us assume for now the dancers, stinkers, and fallers in the above contexts were animate. Animate dancers are almost necessarily attributed responsibility. Someone who cannot desist from dancing (as judged by others) can hardly be imagined. In contrast, leaves may be identified to dance but cannot be attributed responsibility. It has been argued in section 4.1.6.1

that the passive construction is in part restricted to responsible objects. While this statement applies less strictly to personal passives, it can generally be applied to impersonal passives. The former will be discussed in section 4.4.3 in more detail. Impersonal passivization of *tanzen* is possible only where the respective objects are animate, in the optimum human beings, that are necessarily attributed responsibility.

In other words, attributed responsibility is the sufficient condition for impersonal passivization.

The following example illustrates this.

(4.45) *Von den Leuten/#den Blättern ist viel getanzt worden.*
by the people/ the leaves be.3AUX much dance.PTCP was.AUX.PASS
'There was much dancing by the people/by the leaves'

By the same rationale it becomes evident why there are only very few contexts in which impersonal passivization with *stinken* is possible, i.e., well-formed and appropriate. It is possible where its landmark PSC is an animate if not human object, and uttered within a rather infrequent lifeworld context. If there were a bad taste party where the person with the worst odor won a price, it would be conceivable that someone reports on the party the day after in the following manner.

(4.46) *Es ist unglaublich viel gestunken worden.*
It be.3AUX unbelievable.ADV much stink.PTCP was.AUX.PASS
'There was an awful lot of stinking.'

If (4.46) was uttered not in the context of many intentionally stinking people but in the context of many stinking waste containers, it would certainly be impossible. Analogously, a context where impersonal passivization of *(hin)fallen* is possible could be one concerning Italian soccer pros who have the (bad) reputation of simulating being fouled. Being fouled is associated with falling. So if they collectively – and responsibly – simulate being fouled in a soccer match, (4.43) could be uttered appropriately. It certainly could not in the context of apples falling off a tree.
Interestingly, the acceptability of impersonal passives interplays with non-formal features of the active PSC of the construction. In particular, it seems that with verbs/constructions lying at the threshold of passivizability (i.e., having questionable acceptabilities) low individuation of the PSC referent on the individuation scale and a value downstream the person scale increase the acceptability of impersonal passivization. That is the reason why (4.43) is certainly preferable to (4.45), and why (4.46) is certainly preferable to a similar construction including so-called passive *by*-phrase (see also Sansò 2006, Primus 2011).[182]
There is an important implication of the proposed treatment of monadic circumstances and the operations they may undergo: These matters depend primarily on the features, affordances,

[182] Discourse-pragmatic causes of such preferences cannot be discussed in this work, since this lies outside its scope. But see Abraham & Leisiö (2006).

and attributions of the involved objects, respectively, and only secondly on the features that verbs necessarily determine about their complement referents. This means that it is not possible to determine the passivizability of a sentence on the basis of the verb: Wherever the object involved in a monadic circumstance is attributed responsibility for this circumstance, the monadic construction is passivizable. This statement simply does not refer to verbal semantics.[183] (4.44) works similarly.

Imperativization is dependent on the attribution of responsibility along the lines of what has been presented in section 3.2.

So, one could utter *Stink, wie du noch nie zuvor gestunken hast!* 'Stink as you never did before!' when wishing a friend luck for the winning of the stinking contest at the bad taste party, or the coach of the Italian soccer team could utter *Fall!* in the context of his/her player being slightly touched in the penalty area by an opponent. This is not possible for objects that are not capable of activity and that cannot be attributed responsibility. The scale-related preferences regarding the impersonal passive do not hold for imperativization (presumably because the imperative construction is not information-structurally motivated).
The above considerations show that the question of whether a construction is an unergative or an unaccusative one is not a binary one. It depends crucially on the question of what the involved object affords and whether it can be or is attributed responsibility. The semantic structure of "unaccusativity" and "unergativity" is given in Figures 4.46 and 4.47 below. They are modelled on Figures 3.14 and 3.16 from section 3.2.2.3, respectively.
Assuming animate objects, the difference between unaccusatives and unergatives lies in the attribution of responsibility in the latter case (the movement is identified as an action schema which is a means to put some purpose into effect) and in attributing external causes to the object moving in the former case (which is why the object is landmark of the exertion of force and trajector of its movement at the same time). The semantics underlying unaccusativity prohibit impersonal passivization and imperativization. Those underlying unergativity license these operations. In the case of stinking it is possible that not perceiving (or conceptualizing) a possible cause of the odor (e.g., visible dirt) increases the likeliness to attribute responsibility, if the odor bearer is animate.

[183] Construction Grammar and neo-constructionist approaches also reject the "semantic load" of verbs and their projection to syntax (cf. Goldberg 1995, 2006, Borer 2003, Åfarli 2006), but pursue different research-programmes than the one defended here, namely CFL and CL (see Part I).

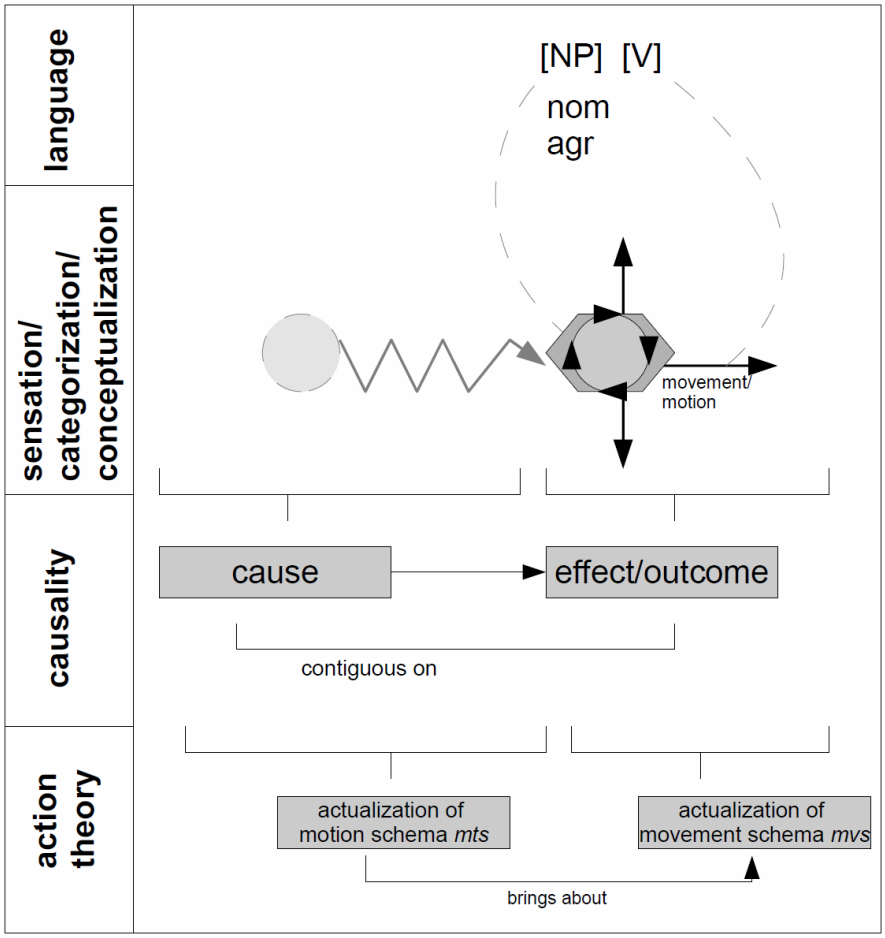


Figure 4.46: Semantics of unaccusativity

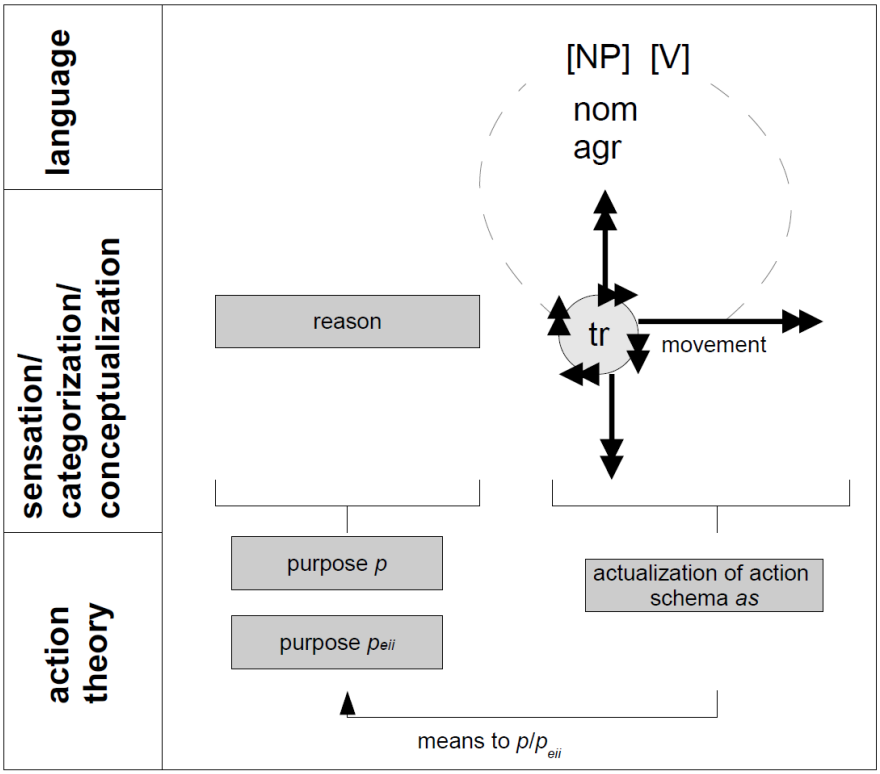


Figure 4.47: Semantics of unergativity

It is well known that languages differ as to how they code the single object in monadic circumstances. For instance, in Nepali the single complement of *fall*, *roll*, and the like is always marked like the object being affected in a dyadic construction (cf. Li 2007). In Tsova Tush (also called Batsbi, a Caucasian language), these verbs are usually marked like the object being affected in a dyadic construction, but in contrast to Nepali, they can also be marked like the (responsible) causer in a dyadic construction ("split intransitivity", cf. Holisky 1987, van Valin 1990). As is demonstrated above, in German this latter strategy is the conventional means for expressing monadic circumstances (besides rather ancient forms like *Mich friert* (me.ACC freeze.3 'I am cold')).

The Batsbi and German patterns are not informative with respect to the semantic status of their single complements. (One cannot simply claim that someone *x*-ing is a responsible person in German, but a non-responsible person in Nepali because of its coding, since this coding may conflate many conceptual and/or actional differentiations). Evidence might come from the restrictions with these constructions on syntactic operations, and, of course, from how Nepali speakers make attributions (i.e., from social psychology). However, the Batsbi split intransitivity pattern has been claimed to be semantically informative (cf. Holisky 1987) in that it codes responsible causers and non-responsible causers or affected objects differently, giving a clue as to the underlying identification and/or attribution patterns.

Where is the cross-linguistic diversity to be located, then? There is firstly, and trivially, the coding pattern, exemplified here by Batsbi, Nepali, and German. With respect to the linking competence, this diversity is semantically not informative because of its merely formal character. Secondly, one could look where – in conceptual terms – the split takes course through monadic circumstances. For instance, it would be interesting to examine whether the split in the intransitivity coding pattern in Batsbi is conceptually in line with the split in German with respect to those monadic circumstances that can undergo impersonal passivization and imperativization and those that cannot. However, in German conceptualization is not informative in this respect either, as has been shown (i.e., the split is not a conceptual one). Someone stinking intentionally and someone stinking unintentionally cannot be differentiated conceptually, since it is a matter of attribution alone. So one could thirdly investigate the coding patterns (split vs. non-split) and restrictions on syntactic operations in languages (passivization, imperativization) in relation to the attribution praxis of their speakers.

That means where instances of stinking are sensed, conceptualized, and coded by similar constructions by the speakers of two different languages, these languages need not exhibit the same linking mechanisms with respect to such circumstances. The split may not be conceptually but actionally determined such that the attributional praxis in one speech community differs from that of another speech community in a way that leads to different restrictions on syntactic operations or on the use of monadic constructions. Particularly, taboos or prohibitions may play a role in such differentiations. Circumstances susceptbile to such splits are especially those close to being tabooed (in many though not all cultures), like those concerning bodily emissions, e.g., stinking, farting, belching etc.

Diversity in linking synax and semantics due to attributional matters may be of two kinds. Firstly, speakers of different languages may enact different praxes of attribution, such that they allow or prohibit attribution of responsibility for similar, mostly precarious

circumstances. One need only survey where the split in monadic circumstances takes course across languages to see that they cannot be mapped onto one another, e.g., in the treatment of people belching. Secondly, and potentially criss-crossing the first factor, attributional praxes of speakers of different languages may differ as to who may be attributed responsibility for his/her deeds and who may not, for instance in dependence of his/her speech act participant (SAP) status in the discourse situation (e.g., deLancey 1981, 1990, Holisky 1987, van Valin 1990, Li 2007, Hori 2008).

4.4.2 Auxiliary choice

In (4.47) the German verbs *tanzen* 'dance' and *stinken* 'stink' on the one hand, and *(hin)fallen* 'fall' on the other hand are shown to be associated with different auxiliaries, respectively.

(4.47) *x hat getanzt/ hat gestunken/ ist (hin)gefallen.*
x.NOM have.3AUX dance.PTCP/ have.3AUX stink.PTCP/is.3AUX fall.PTCP
'Alex danced./Alex stunk./Alex fell.'

Keller and Sorace (2003) have nicely modelled the auxiliary choice for the perfective verb form in German by making use of an "auxiliary selection hierarchy" (ASH).[184] The units ranging on the hierarchy, though relatively independent of particular theories of grammar, are not separately motivated or deduced. For instance, Keller's and Sorace's "process" conflates what is differentiated here as process and activity, i.e., motion and movement, respectively. For a brief but thorough diachronic motivation of auxiliary choice be referred to Dal (^{3}1966) (see also Fleischer & Schallert 2011). My claim is that these notion can quite well be reconstructed by means of the theory proposed here. The original ASH is given below in Table 4.5.

change of location	selects 'be' (least variation)
change of state	
continuation of state	
existence of state	
uncontrolled process	
controlled process (motional)	
controlled process (non-motional)	selects 'have' (least variation)

Table 4.5: The general, i.e., typologically motivated ASH (Keller & Sorace 2003: 60)

The ASH says that if a lexical intransitive verb designates a "change of location", then it (nearly) invariably takes a form of 'be' as auxiliary. If it designates a "controlled process (non-motional)" it (nearly) invariably takes a form of 'have' as auxiliary. The more the designated circumstance of a lexical verb ranges in the middle of the hierarchy, the greater the variation of its auxiliary choice is across languages and non-Standard German varieties. What

[184] The ASH was introduced by Sorace (2000) in the context of auxiliary selection in several languages.

is especially interesting is that at the top of the hierarchy there are complex circumstances, i.e., processes or activities with more than one sub-part. Towards the middle there are simple states. And towards the bottom there are simple processes and simple activities. Furthermore, from "existence of state" downwards, "control" (i.e., responsibility) becomes important, and from "continuation of state" upwards, "change" (i.e., complexity) becomes important. In this section I will try to factor in transitive relations, too, and to reconstruct older insights – the ASH – in terms of the theoretical apparatus developed here.

Looking at the upper half of the ASH first, one finds "existence", "continuation", and "change" as temporal matters, and "state" and "location" as featural and spatial matters, respectively. Change of location and change of state involve a perceptually salient process or activity in that something moves somewhere or some feature of something – or its whole integrity – changes, appears or disappears. Both maybe processes or activities. If they are processes, they are probably caused. If they are activities, they are potentially uncaused. If caused, the moving or feature-changing object is the landmark of causation and the trajector of change. The linking schema for change of location is given in Figure 4.48.

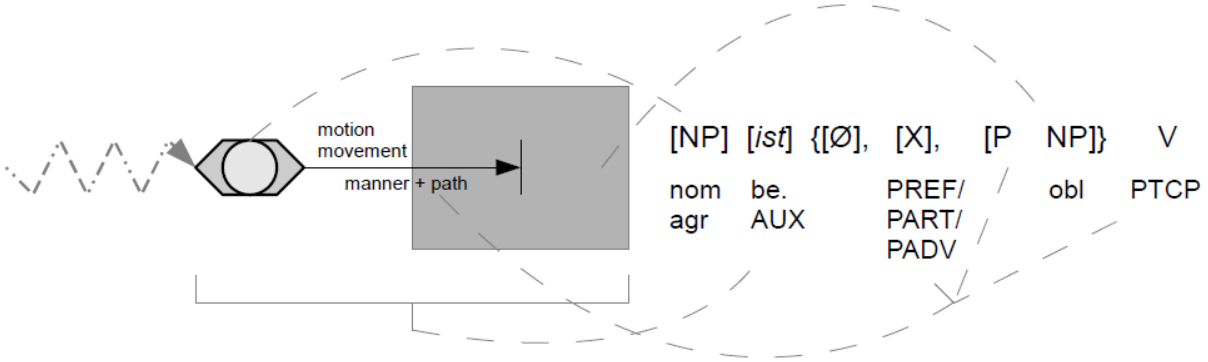


Figure 4.48: Linking schema for auxiliary choice in ASH "change of location" circumstance

This is also the structure underlying *x ist (hin)gefallen* in (4.47) above, where *x* bears nominative case, agrees with the verb, and is thus the PSC. If the circumstance is caused, the PSC referent is the landmark of the causation relation, but the trajector of the motion/movement relation. If it is not caused, the PSC referent is only a trajector. It is important to note that the motion/movement is one which comes to rest in the last sub-part of the circumstance which makes the circumstance complex. The complexity of the circumstance is compressed into one schematic in the above Figure. This whole setting finds its expression in the choice of a form of 'be' as auxiliary. Furthermore, manner of the motion/movement is coded in the verb participle. Path can generally be coded in the verb (leading to zero ("ø") additional lexical material), in the P of an NP, or in the prefix, particle, or prepositional adverb attached to the verb. If it is a PP, then P mostly governs accusative case indicating motion/movmement towards some destination, and not stative being located. In the case of the *(hin)fallen* utterance above, the prepositional adverb strategy is realized, i.e., in *hin* 'towards'.

Consider next the linking schema for corresponding to the ASH "change of state".

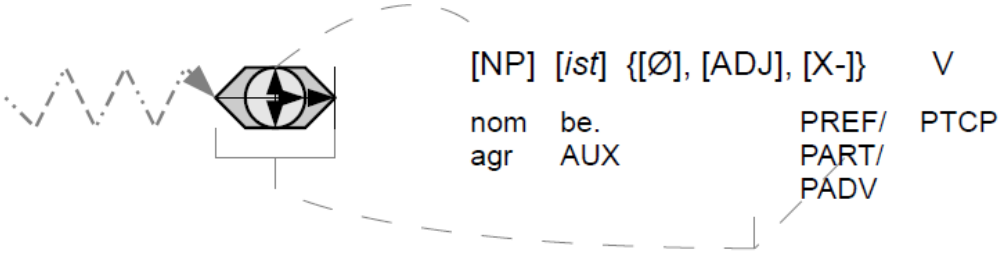


Figure 4.49: Linking schema for auxiliary choice in ASH "change of state" circumstance

The difference to the former structure lies in the fact that here one is dealing with a featural change, not with a spatial one. Therefore, the verbalization option of a PP is absent here in favor of an adjective indicating the final stative sub-part of the circumstance. The featural change may concern the coming about or ceasing of something or the transition of some feature into another. Examples would be *x ist verstorben/errötet/dick geworden* 'x has passed away/turned red/put on weight'. Because the conceptual metaphor FEATURES/PROPERTIES ARE RELATIONS is prevalent across languages (cf. Lakoff & Johnson 1980, 1999, but see section 3.3.3.1), and because featural changes thus describe something like a path, too (CHANGE OF FEATURES/PROPERTIES IS CHANGE OF LOCATIONS), path expressions are present in the prefixes of *versterben* and *erröten*, indicating the stative final sub-part of the circumstance. In *x ist dick geworden*, this is accomplished by an adjective *dick*.
For reasons that will become clear further down this section, I will now discuss "controlled processes (motional)". The linking schema for these circumstances is given in Figure 4.50.

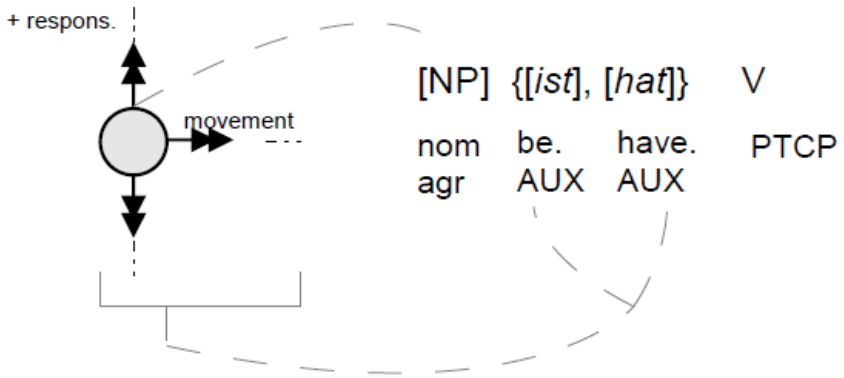


Figure 4.50: Linking schema for auxiliary choice in ASH "controlled process (motional)" circumstance

The schematic shows that there is no external cause to the circumstance but that the single object involved in it is one that moves by itself (it is active), and is attributed responsibility for its movement, either by imposition by the actor/cognizer, or lexically enforced. The important feature that makes these circumstances similar to the others selecting 'be' as auxiliary, too, is that movement is involved. They can nevertheless under certain conditions be realized with 'have'. Also important is that this movement is neither definitively directed somewhere nor leads to a stative final sub-part of the circumstance. Additional expressions coding paths or resultant states are therefore mostly absent. Examples are *x ist gefahren/gewandert/geklettert/gekrochen/gerutscht* 'x has driven/wandered/climbed/crawled/slid'.

The ASH units "existence" and "continuation of state" are conflated in Figure 4.51. This will be justified in turn.

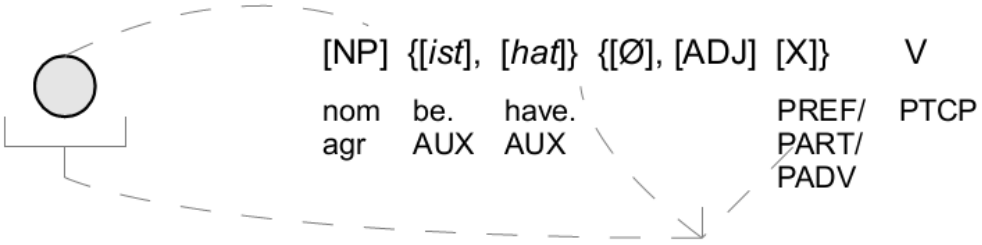


Figure 4.51: Linking schema for auxiliary choice in ASH "existence" and "continuation of state" circumstance

In circumstances of the type depicted in Figure 4.51 nothing happens. There is no change of anything but only the spatial or featural state of something, and in particular at the time of the predicated tense (in the case of "existence of state") or extending the time of the predicated tense towards the future (in the case of "continuation of state"). "Continuation" has undoubtedly a temporal connotation or even denotation today, and the "continuation of state" class actually includes many verbs coding primarily temporal matters, e.g., *verharren* 'persist', *bleiben* 'remain', *überleben* 'survive'. The underlying circumstances, though simple, are often verbalized using adjectives (in predicative constructions) and particles/prepositional adverbs/prefixes together with the verb. Where the verbs code a temporal meaning, they make use of the conceptual metaphor TIME IS SPACE (but see section 3.3.3.1). It is implicit in earlier discussions, however, that the conceptualization of a hat being red does not differ from the conceptualization of a hat remaining red. Verbs like *remain* are thus instances of exploitation: They pretend to code a simple conceptualization but they do not (see sections 3.3.2/3.3.3). Temporal continuation may only manifest itself in invariance across encounters, i.e., in invariance across circumstances conceptualized. Thus, if I sense and identify a red hat (1st identification) and I plan to wear that red hat at the wedding of my sister (2nd conceptualization in action planning), then it is my interest that the hat is still red when wedding day has come where I will ascertain this (3rd identification). Only in relation to such temporally "distributed" conceptual activities it is appropriate to say that the hat *remains* red. And this is why such verbs only pretend to code simple conceptualizations.

In contrast to the circumstances involving change, the stative ones are variable with respect to their auxiliary choice. While *bleiben* is used with a form of 'be', *verharren* and *überleben* are used with one of 'have'. As is often the case with synchronically competing forms, there seems to be language change in progress with the most variable classes. For instance, loss of perfective meanings of verbs is associated with the expansion of 'have' as auxiliary (cf. Dal ^{3}1966).

Between these last two lexical classes (which is one, conceptually) and the next one in the lower half of the ASH there is a major split. While in the upper half change vs. no change and spatial vs. featural are supposed to be the factors governing auxiliary choice, it is – superficially – "control" vs. "no control" in the lower half. At this point, Keller and Sorace (2003) state that the hierarchy does not work for German as it does for other languages. While

"uncontrolled processes" are closer to selecting 'be' on the ASH than "controlled processes (motional)", the former predominantly select forms of 'have' in German, while the latter predominantly select 'be' forms in German. In Keller's and Sorace's data, for "controlled processes (motional)" acceptability of 'be' was higher, and acceptability of 'have' was lower only in the two "change" classes at the top of the ASH. The ASH for German is thus the revised one below in Table 4.6.

change of location	selects 'be' (least variation)
change of state	
controlled process (motional)	
continuation of state	
existence of state	
uncontrolled process	
controlled process (non-motional)	selects 'have' (least variation)

Table 4.6: The ASH for German non-causative constructions (adapted, based on Keller & Sorace 2003: 60)

Verbs expressing uncontrolled processes are, for instance, *zucken* 'convulse', *zittern* 'shiver', *stinken* 'stink', *schnarchen* 'snore'. That means these verbs designate simple monadic circumstances, in particular those that have been discussed in the previous section on "unaccusatives" and "unergatives" and which – under certain circumstances – may skip from one class to the other while this does not make a difference with respect to auxiliary choice. They are indeterminate with respect to causation. What is worth mentioning is, however, that these verbs often express pure manner concepts with path expressions only contingently attached to them or coded in them. If there is some aspect of motion/movement about these circumstances, it is not definitively directed anywhere (it often involves emission of sound or odor) and does not develop into a stative final sub-part of the circumstance. This is why the arrows indicating motion/movement are shaded. The underlying structure is given in Figure 4.52.

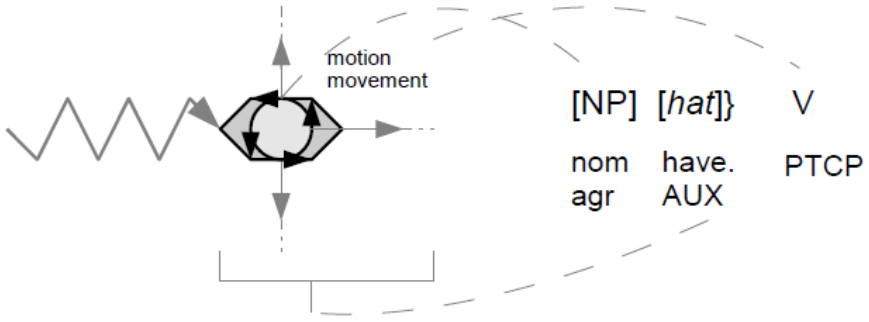


Figure 4.52: Linking schema for auxiliary choice in ASH "uncontrolled process" circumstance

The lowermost unit on the ASH, and that most closely connected with the auxiliary 'have', is "controlled process (non-motional)". Verbs in this class designate activities of responsible persons that do not involve change of position in space as in *x hat geschrieben/gearbeitet/telefoniert/geredet/gesungen* 'x has written/worked/phoned/talked/sung'. The difference to the previous class thus lies in the absence of causation and in the absence of spatial extension of the activity. The corresponding linking schema is given in Figure 4.53.

Figure 4.53: Linking schema for auxiliary choice in ASH "controlled process (non-motional)" circumstance

Now, when looking at the conceptual structures underlying the ASH for German, one finds

(a) a decrease in circumstance complexity from top to bottom (actually, complexity is reduced to 1 at "controlled process (motional) " already),
(b) a decrease in spatial extension of movement/motion from top to bottom, accompanied by
(c) an increase in spatially non-extended movement/motion from top to bottom.

Factors (b) and (c) determine the deviation of the German ASH from the rather cross-linguistically motivated "general" ASH by Keller & Sorace (2003). The governing factor in the general ASH from the middle to the bottom seems to concern matters of responsibility. In German the factor "spatially non-extended movement/motion" seems to override that of responsibility, leading to the shift of "controlled process (motional)" towards the top of the ASH. However, the complex diachrony of auxiliary choice does not exclude the possibility that German intransitive and transitive (causative) constructions could work differently from one another in this respect (cf. Dal ^{3}1966, Fleischer & Schallert 2011). In particular, matters of responsibility may play a part in the latter.
Factoring in causative, i.e., transitive dyadic relations, shows that they entirely choose 'have' as auxiliary (cf. Dal ^{3}1966: 122). Consider (4.48) and (4.49) first which are repeated from section (4.1.6.2).

(4.48) *Ein Glas ist zerbrochen.*
a.3NOM glass be.3 break.PTCP
'A glass is broken.'

(4.49) *Willi hat ein Glas zerbrochen.*
Willi.3NOM have.3 a.3ACC glass break.PTCP
'Willi broke a glass.'

In (4.48) we have an instance of a "change of state". It is predicted by the ASH to take 'be' as auxiliary. This is the case. The ASH provides no treatment of cases like (4.49). My claim is that on the basis of the spatial and temporal grounding of conceptualization as outlined in previous sections it can be deduced. One must firstly look at the temporal organization of the circumstance. One finds that in its first sub-part Willi must exert force towards the glass. Underlying such an instance of causation are always two circumstances that are spatially and temporally contiguous on each other. Thus, in the second sub-part the glass loses its integrity by breaking, and in the final sub-part the former glass persists without integrity as pieces of glass. Strictly speaking, there are three circumstances then that could each be verbalized in perfect tense by a single construction such that for each one an auxiliary would have to be chosen. The second sub-part of the whole circumstance underlying (4.49) is identical with that underlying (4.48) – a change of state associated with 'be'. The third sub-part – that of an existence/continuation of state – varies between 'be' and 'have'. It is not important here. But crucially, the first sub-part is Willi's activity towards the glass, where Willi is potentially though not necessarily attributed responsibility. It is thus either an "uncontrolled process" or a "controlled process (motional)" in terms of the ASH. Using the "general" ASH for the explanation of causative circumstances here and leaving the German ASH only for monadic circumstances would predict us the selection of 'have' for (4.49). Further evidence for the significance of responsibility matters with causative dyadic relations is indicated not only by the choice of a 'have' auxiliary but also in the lexicalization of the movement pattern in other cases than (4.49). For instance, the first subpart of *das Glas fällt hin* 'The glass falls down' and the the second sub-part of *Willi wirft das Glas hin* 'Willi throws the glass down' are conceptually identical. The difference between *throw* and *fall* lies in the presence of the responsible person. Thus, the choice of 'have' forms for causative dyadic relations can be deduced from the spatio-temporal grounding of the linking competence and the ASH. But what about cases like those in (4.50) and (4.51)?

(4.50) *Willi ist ins Haus gegangen.*
Willi.3NOM be.3AUX in-the.ACC house go.PTCP
lit. 'Willi has gone into the house.'

(4.51) *Willi hat ins Haus gespuckt.*
Willi.3NOM have.3AUX in-the.ACC house go.PTCP
lit. 'Willi has spit into the house.'

In a nutshell, (4.50) is a complex relation with a stative final sub-part and therefore selects a form of 'be' as auxiliary. It is an instance of the ASH "change of location" with a PP path expression. What is different about (4.51)? The answer is that Willi's movement is not identical with the motion of his spittle. In the first sub-part of the circumstance Willi acts in a

spatially non-extended manner. The result is the second sub-part in which spittle moves into the house. In the final stative sub-part, the spittle is located in the house. It is thus a variant of (4.49) above. The difference lies in the fact that (4.51) pretends to be a dyadic relation (between Willi and the house), while it is actually a triadic one (the spittle is also involved).
A final remark concerns conceptual metaphor. As becomes evident through the importance of visual perception, spatial relations are the basis for temporal and other relations for which humans possess no perceptual modality. The ASH illustrates that spatial relations that are directed somewhere and find their destinations somewhere are stronlgy associated with 'be' auxiliaries. Now, it seems that where conceptual metaphors of the type X IS SPACE are grammaticalized (expressions originally spatial in kind have lost their spatial conceptualization), they tend to take over 'have' as auxiliary. Where there is a homonymous form with a preserved spatial conceptualization underlying it, it preserves a form of 'be' as auxiliary. This is given in *x hat y gefallen* 'x appealed to y' vs. *x ist gefallen* 'x fell', *x ist y gefolgt* 'x followed y' vs. *x hat y gefolgt* 'x obeyed y'*, x ist gegangen* 'x went away' vs. *Das hat gut gegangen* 'That worked well'.

4.4.3 Conditions on passiviziation and imperativization

In section 4.4.1 the condition on impersonal passivization has already been mentioned. It is the attribution of responsibility to the single object in a monadic circumstance with respect to that circumstance. This is only half of the truth with regard to the passivization of complex dyadic or triadic circumstances (henceforth "personal passive"). Consider (4.52).

(4.52) *Ihm ist das Haar vom Wind zerzaust*
Him.DAT be.3AUX the.3NOM hair by-the.DAT wind tossle.PTCP
worden.
was.AUX.PASS
'His hair was tossled by the wind.'

Obviously, responsibility is not the critical feature that governs the applicability of the personal passive because, if it were, (4.52) should not be well-formed. Now compare (4.52) to (4.53) below which is not well-formed.

(4.53) #*Ihm ist vom Wind durchs Haar geweht*
Him.DAT be.3AUX by-the.DAT wind through-the.ACC hair blow.PTCP
worden.
was.AUX.PASS
lit. 'His hair was blown through by the wind.'

The difference between the two sentences can be characterized as follows: The state of the hair changes in (4.52) due to exertion of force, as it is coded in the verb *zerzausen* 'tossle'. In contrast, *durch etwas wehen* 'blow through sth.' does not code any exertion of force and change of state in that through which something blows. The reason is simple. In (4.52) the hair is an object landmark, in (4.53) it is a location landmark – nothing in the integrity,

features, or location of the hair is altered, it cannot undergo exertion of force. The hair accidentally lies in the path of the wind, who passes it. In the case of (4.52) the hair also lies in the path of the wind, but partially blocks it, thereby becoming causally affected by it. The difference is captured in Figures 4.54a and b below:

Figure 4.54a: Conceptualization licensing personal passive

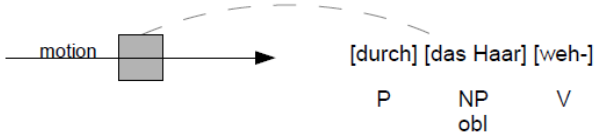


Figure 4.54b: Conceptualization not licensing personal passive

There are active constructions that look as if they code exertion of force and/or a change of state, feature, or location in an object, while they do not. This is the case in (4.54) and (4.55). In (4.54) the two objects stand in a relation of inalienable possession or nearly identity. In (4.55) there is a simple, i.e., stative circumstance in which no change of state can be caused. If it were complex, (4.55) would be modifiable by an adverb like *plötzlich* 'suddenly' after the finite verb, but it is not.

(4.54) #/*Er/#/*Ihm ist vom Kopf geschmerzt worden.
He.3NOM/DAT be.3AUX by-the.DAT head ache.PTCP was.AUX.PASS
lit. 'He was ached by his head.'

(4.55) #Er wird von dem Vorfall gewundert.
He.3NOM be.AUX.PASS by the.DAT incident amaze.PTCP
'He gets amazed by the incident.'

(4.56) below is more difficult. It is not modifiable by an adverb indicating a complex circumstance, i.e., it is a simple relation not including a change of state. Nevertheless, it is passivizable, just like stative *ängstigen* 'frighten' or *(ver)trauen* 'trust' but unlike *wundern* 'be amazed/surprised about sth.', or *gefallen* 'appeal to s.o.'.

(4.56) Er wird von den Kindern gefürchtet.
He.3NOM be.AUX.PASS by the.DAT children fear.PTCP
'He is feared by the children.'

Interestingly, all these verbs code a similar spatio-temporal conceptualization. The question is then why some of them allow passivization, while others do not. A change of state or location in the landmark is not the critical feature, since all these circumstances lack it. Returning to the impersonal passive, the attribution of responsibility to their PSCs might be the governing factor. If this is the case, it means that the fearers in *fürchten* 'fear', the trusters in *(ver)trauen* 'trust', and the frighteners in *ängstigen* 'frighten' circumstances can be, and in fact are attributed responsibility, while the wonderers in *wundern* 'wonder, be amazed about' and the

appealers in *gefallen* ‘appeal to s.o.’ circumstances are not. This in turn should allow the imperative with these verbs under the same license used in the passivization of impersonals.

(4.57) *Fürchtet ?ihn/euch nicht!/Habt keine Angst!*
Fear.IMP him.ACC you.ACC.REFL not/Have.IMP no.ACC fear
‘Don’t be afraid (of him)!/Don’t be afraid!’

(4.58) *Ängstige ihn nicht!/Mach ihm keine Angst!*
Frighten.IMP him.ACC not/Make.IMP him.DAT no.ACC fear
‘Don’t frighten him!’

(4.59) *Trau ihm nicht!*
Trust.IMP him.DAT not
‘Don’t trust him!’

(4.60) *Wundere #ihn/#dich nicht!*
surprise.IMP it.ACC/you.ACC.REFL not
‘Don’t be surprised!/amazed (about it)!’

(4.61) *#Gefalle ihm nicht!*
Appeal.IMP him.DAT not
‘Don’t appeal to him!’

(4.57) obviously deviates from (4.56), syntactically. Having *ihn* ‘him’ as accusative with *fürchten* is acceptable primarily in formal/literary and/or written language. The reflexive variant is closer to usage in spoken language, and *Habt keine Angst* ‘Don’t be frightened’ is certainly the most usual utterance. The latter shall demonstrate that imperatives in the semantic domain of *fürchten* are acceptable and appropriate in principle, even though *jmd. fürchten* ‘fear s.o.’ cannot be passivized in a syntactically faithful manner. The same is true for *ängstigen* ‘frighten’: It is preferably used in written texts, *Mach ihm keine Angst* ‘Don’t frighten him’ is more natural in spoken language. The imperative with *trauen* ‘trust’ is perfectly possible, i.e., appropriate, while that with *wundern* ‘wonder, be amazed/surprised about sth.’ is only when it is used reflexively, and only under a specific pragmatic circumstance, namely if uttered before and in anticipation of the addressee being surprised by some surprising circumstance (e.g., *Don’t be surprised if Alex is not at home when you call him, because he works on Sundays.*). It is in any case inappropriate with an accusative complement, as is (4.61) with *gefallen*.

That means personal passivization is possible in diagrammatically iconic conceptualizations of complex dyadic or triadic circumstances where force is exerted on the landmark object, and/or in simple (stative) dyadic or triadic circumstances where the PSC referent of the verb is attributed responsibility for the coming about of the circumstance.

In other words, it is closely related to the RCP discussed above. By way of example, the conceptual structure of the latter condition (for *fürchten* 'fear' in the active variant of 4.56) is given in Figure 4.55. As another conceptualization licensing the personal passive, it complements the conceptual structure in Figure 4.54a .

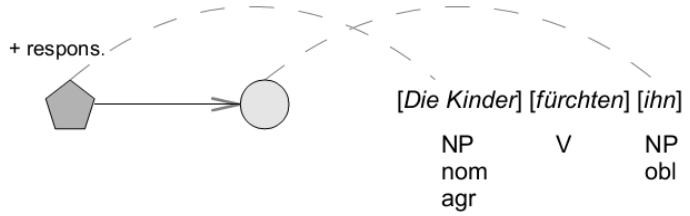


Figure 4.55: Second conceptualization licensing the personal passive

Note that what has been said about non-formal scale information about the PSC referent of the active construction of an impersonal passive construction is also true for personal passives: Low values on the person and individuation scales increase the acceptability of personal passives.
Concluding this section, the above linking criterion for passivization predicts that *ängstigen* 'frighten' should be passivizable only if it codes a complex circumstance with a change of state and/or if its PSC referent is attributed responsibility. That means an utterance including *ängstigen* that does not satisfy both criteria should be impossible to passivize. This is illustrated by (4.62a) and (b).

(4.62a) *Peter ist ein Junge, den Gewitter*
Peter.3NOM be.3 a.3NOM boy who.3ACC thunderstorm.3PL.NOM
ängstigen.
frighten.3PL
'Peter is a boy who is afraid of thunderstorms.'
'Peter is a boy who gets scared by thunderstorms.'

(4.62b) *Peter ist ein Junge, der von Gewittern*
Peter.3NOM be.3 a.NOM boy who by thunderstorm.3PL.DAT
geängstigt wird.
frighten.PTCP be.AUX.PASS
#'Peter is a boy who is afraid of thunderstorms.'
'Peter is a boy who gets scared by thunderstorms (everytime there is one).'

(4.62b) is predicted to be possible only if Peter is interpreted as getting scared (i.e., change of state) everytime there is thunderstorm. A final prediction concerns typology. Because restrictions on passivization are closely related to the conditions governing split intransitivity, one would expect cross-linguistic differences in passivizability due to different praxes of attribution; firstly concerning the question of where the split between passivizability and non-passivizability – as a symptom of attributing responsibility or not – semantically takes place, and secondly concerning which SAP status the (responsible) causer has.

4.4.4 The dative alternation

A theory with a rather general scope like the one proposed here cannot do justice to all proposals with regard to the so-called dative alternation. Virtually every theory of the syntax-semantics relationship has dealt with this phenomenon (e.g., Kaplan & Bresnan 1982, Larson 1988, Jackendoff 1990, Goldberg 1995, Wunderlich 1997, Newman 2005, van Valin 2005, Bresnan et al. 2007, Rappaport Hovav & Levin 2008). The following rather brief discussion of the dative alternation follows from and is based on that of the dative in section 4.1.6.2. The examples used there and the underlying linking schemas are repeated below. Note that information-structural considerations will not be taken into account here.

(4.63) *Matthias hat dem Professor einen Brief geschickt.*
Matthias.3NOM has.3 the.3DAT professor a.3ACC letter send.PTCP
'Matthias sent the professor a letter.'

(4.63) is an instance of the so-called "double-object" construction (henceforth: DOC) containing a dative and an accusative complement. This type of dative has been identified above to be related to asymmetrical bi-directionality: In order to utter (4.63) in a situationally appropriate manner, the dative referent is required to move toward the object that is moving toward him/her and the dative referent may even be attributed responsibility in addition to the nominative referent.

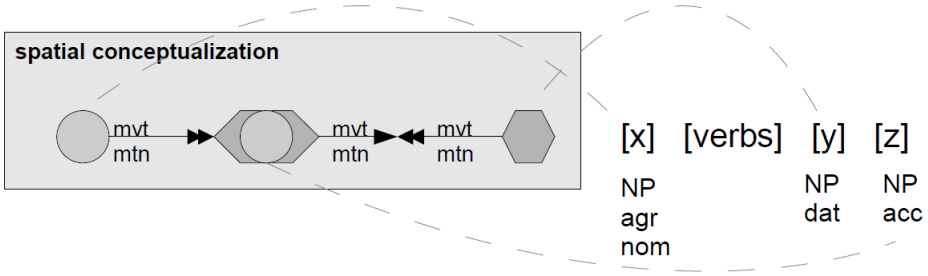


Figure 4.56: Linking schema underlying the "double-object" construction

In contrast to the "double-object" construction, the "prepositional object" construction (henceforth: POC) lacks a dative. The addressee of the transfer relation is expressed by means of a prepositional phrase instead.

(4.64) *Matthias hat einen Brief an den Professor geschickt.*
Matthias.3NOM has.3 a.3ACC letter to the.3OBL professor send.PTCP
'Matthias sent a letter to the professor.'

In the present proposal, the absence of a complement bearing dative case in a transfer relation is associated with the absence of symmetrical or asymmetrical bi-directionality in conceptualization:

There is no object that moves against the motion/movement of the transferred object, as is indicated in the conceptual structure underlying such constructions, depicted in Figure 4.57.

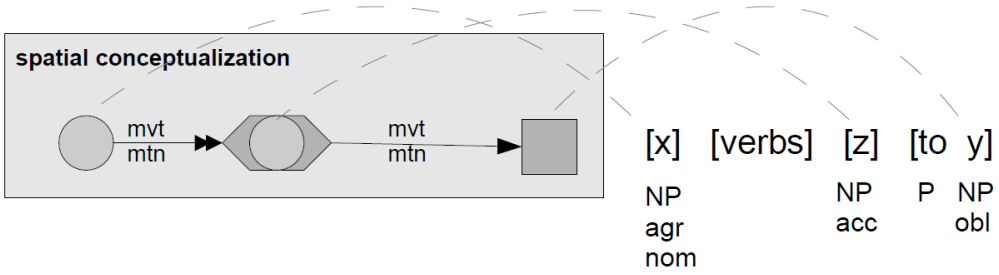


Figure 4.57: Linking schema underlying the "prepositional object" construction

At the same time, if there is a possible alternation between a DOC and a POC, the dative involved in the former is always one of type (i (a)) from section 4.1.6.2 exhibiting symmetrical or asymmetrical bi-directionality.

That is why triadic circumstances with datives of type (i (b)) and (c) do not occur in the POC. (4.65) and (4.67) show the POC variants of (4.66) and (4.68) from section 4.1.6.2, respectively. They are repeated below.

(4.65) **Alex hat das Auto zu/nach/an Christina*
Alex.3NOM have.3 the.3ACC car to/to/ to Christina.3DAT/DAT/ACC
gewaschen.
wash.PTCP
lit. 'Alex washed the car to Christina.'

(4.66) *Alex hat Christina das Auto gewaschen*.
Alex.3NOM have.3 Christina.3DAT the.3ACC car wash.PTCP
'Alex washed Christina the car.'

(4.67) **Dass du das Fenster nicht zu/nach/an mir/mich triffst!*
that you.2NOM the.3ACC window not to/to/ to me.1DAT/ACC hit.2
approx. 'Don't even think about hitting the window to me.'

(4.68) *Dass du mir nicht das Fenster triffst!*
that you.2NOM me.1DAT not the.3ACC window hit.2
'Don't even think about hitting the window.'

From this simple treatment of the alternation in terms of bi-directionality, some predictions can be derived:

(a) The presence of an immobile addressee (or one not affording movement/motion) is prohibited from being verbalized by means of a DOC. This includes especially location landmarks.
(b) The non-requirement of movement/motion on the side of the addressee in the POC even allows addressees without object features in that role. In other words, the addressee in the POC may be an object landmark or a location landmark.

(c) The complex circumstance underlying the DOC has one sub-part more than that underlying the POC. This should cause differences in the appropriateness of their use.
(d) The manner of transfer has an influence on the probability of the success of the respective transfer. This in turn correlates with the constructions that are associated with verbs designating different manners of transfer.

Concerning (a) and (b), consider (4.69) and (4.70) which are variants of (1.3a) and (b) from part I.

(4.69) *Matthias hat einen Brief nach Marburg geschickt.*
Matthias.3NOM has.3 a.3ACC letter to Marburg send.PTCP
'Matthias sent a letter to Marburg.'

(4.70) #*Matthias hat Marburg einen Brief geschickt.*
Matthias.3NOM has.3 Marburg.3DAT a.3ACC letter send.PTCP
lit. 'Matthias sent Marburg a letter.'

Marburg, unless interpreted metonymically as standing for some person, must be conceptualized as a location landmark. In this case the DOC is prohibited, i.e., it will not be used by a speaker and will be found unacceptable by an interpreter. At the same time, a location landmark is quite natural in the POC.
Concerning (c), the POC actually leaves indeterminate the involvement of the adressee in terms of movement/motion instead of definitively coding his/her passivity. If the addressee in the POC affords movement/motion, he/she may – semantically – fulfil the requirements of a dative referent, i.e., actually move towards the transferred object. The reason for using a POC is then the uncertainty of the status of the addressee to the conceptualizer such that he/she does not make a statement as to his/her activity. That means uttering the POC is appropriate whenever the transferred object is conceptualized as being on its way towards the addressee, the latter's exact nature being irrelevant. This movement/motion constitutes the last sub-part of the circumstance conceptualization underlying the POC. Now, in the conceptualization underlying the DOC the transferred object is also on its way to the addressee in some sub-part of the circumstance. But the DOC imposes additional restrictions on the addressee that are not there in the POC, namely the movement/motion of the addressee towards the transferred object and his/her receiving it which constitutes its final sub-part. That in turn means that when using the DOC is appropriate, using the POC is appropriate, too (but see further below). In other words, the complex circumstance underlying the DOC has one sub-part more than that underlying the POC. Considering Matthias, the letter, and the professor again, imagine Matthias has sent a letter and the professor did not get it. The above considerations would imply, then, that (4.72) is an appropriate utterance in this situation, while (4.71) is less appropriate.

(4.71) #*Matthias hat dem Professor einen Brief geschickt, aber*
Matthias.3NOM has.3 the.3DAT professor a.3ACC letter send.PTCP but

er *ist* *nicht angekommen.*
it.3NOM be.3AUX not arrive.PTCP
'Matthias sent the professor a letter, but it did not arrive (at him).'

(4.72) *Matthias* *hat* *einen* *Brief* *an den* *Professor geschickt, aber*
Matthias.3NOM has.3 a.3ACC letter to the.3OBL professor send.PTCP
er *ist* *nicht angekommen.*
it.3NOM be.3AUX not arrive.PTCP
'Matthias sent a letter to the professor.'

Imagine the letter is still on its way, with an uncertain outcome. Then both (4.63) and (4.64) are appropriate utterances. Now, the difference lies in the fact that the circumstances underlying the DOC and POC are instances of different circumstance schemas conceptualized by the respective speakers. While uttering (4.64) means that the speaker has conceptualized an action schema of sending up to the point where the letter is on its way, uttering (4.63) means that the speaker has conceptualized an action schema of sending up to the point where the professor receives the letter. Action planning for the person having uttered (4.64) is in a sense safer, since he/she can plan his/her actions on the certain ground of Matthias having sent the letter. There is nothing imponderable about his/her calculations. At the same time, his/her action planning does not take into account the potential or probable situation where the circumstance turns out to have been successful, i.e., the professor having the letter. This is the case with the action planning of the person having uttered (4.63). It proceeds on uncertain grounds – he/she predictively asserts the receiving of the letter by the professor – but his/her calculations already include the situation where the professor has the letter (and perhaps knows what is in it). Of course, this happens at the risk of being forced to re-conceptualize the entire action plans if the action schema of sending someone something turns out to have failed.[185]

Turning to (d), it is obvious that *schicken* 'send' codes a circumstance in which the transferred object is "free-floating" in one of its sub-parts in the sense of not being located at either the source (e.g., Matthias in (4.63)) or at the addressee (e.g., the professor in (4.63)). This distinguishes it, for instance, from *geben* 'give'. Giving events are nearly exclusively face-to-face interactions and their outcomes are most probably successful. Something goes from one hand to another hand, the transferred object is at no point "free-floating". If it were, it would already be a throwing event. Much more can interfere in a sending and throwing event. It seems as if a circumstance sub-part with a free-floating transferred object is the condition on the POC. This is the reason why *geben* 'give' does not occur in the POC. Further above it has been claimed that from the perspective of spatio-temporal conceptualization the POC is appropriate wherever the DOC is appropriate. This must now be restricted to transfer circumstances in which the transferred object is in some sub-part free-floating. Where it is not, the DOC is the strongly preferred construction for transfers. This can be illustrated by means of verbs of communication. Verbs of face-to-face communication tend to occur in the

[185] A variant of the *jmd. etw. senden* 'send s.o. sth.' vs. *etw. an jmd. senden* 'send sth. to s.o.' opposition is the *jmd. etw. zuwerfen* 'throw s.o. sth.' vs. *etw. zu jmd. werfen* 'throw sth. to s.o.' opposition. Although there are prepositions/particles/prefixes involved, they work similar semantically.

DOC, e.g., *erzählen* ‘tell’, *sagen* ‘say’, while verbs of remote communication work like the *schicken* ‘send’ type, i.e., they vary between DOC and POC, e.g., *faxen* ‘to fax’, *mailen* ‘e-mail s.o. sth.’, *SMSen* ['zImzən] ‘send by writing a short message using mobile phone short message service (SMS)’. The same rationale can be applied to all novel, exceptional and creative cases of DOCs and POCs (see Goldberg 1995, 2006). For instance, in the Iliad one can find Zeus nodding Hera his consent (*jmd. etw. zunicken*).[186] This is a face-to-face interaction where information is transferred and which can only succeed with Hera’s active engagement in the direction of Zeus. It will therefore not work with the POC *(*etw. an jmd. (zu)nicken* ‘nod sth. to s.o.’).

4.4.5 The locative alternation

The locative alternation was already mentioned in section 4.1.3. The relevant examples are repeated here as (4.73a) and (4.73b).

(4.73a) *Peter malt Bäume auf die Mauer.*
Peter.3NOM paint.3 tree.ACC.PL on the.ACC wall
‘Peter paints trees on the wall.’

(4.73b) *Peter bemalt die Mauer mit Bäumen.*
Peter.3NOM HOL-paint.3 the.ACC wall with tree.DAT.PL
‘Peter paints the wall with trees.’

To recapitulate, the (b) variant is often associated with an interpretation in which the painted object is holistically affected. Earlier I indicated that this meaning can be traced to a Germanic preposition **bi-* which is today grammaticalized either as prefix to the verb stem, as in (4.73b), or is not any more overtly expressed as in English *paint*, while the respective landmark expression behaves as if it were still present. The meaning of **bi* (approx. ‘directed at x, embracing it as a whole’) requires it to be perceivably spatially delimited, i.e., spatially delimited within the visual or simulated visual field. The underlying linking schemas are given below. (Note that these are more detailed now than those in section 4.1.3 and thus differ from them.)

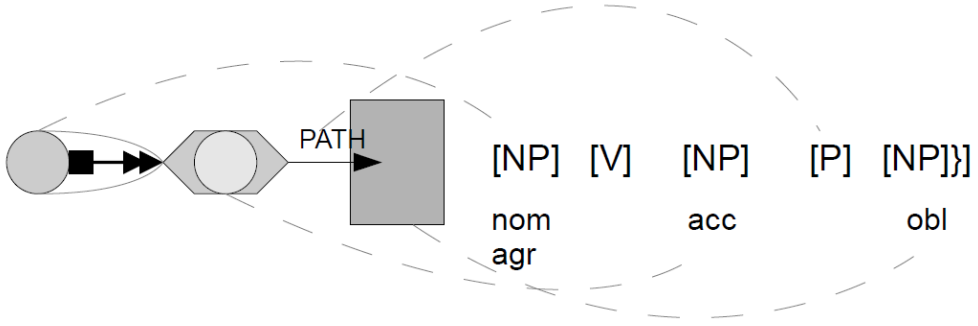


Figure 4.58: Linking schema underlying the NP_{nom}-V-NP_{acc}-P_{path}-NP construction in the locative alternation

[186] This is based on Schadewaldt’s translation of Homer (^{5}1985).

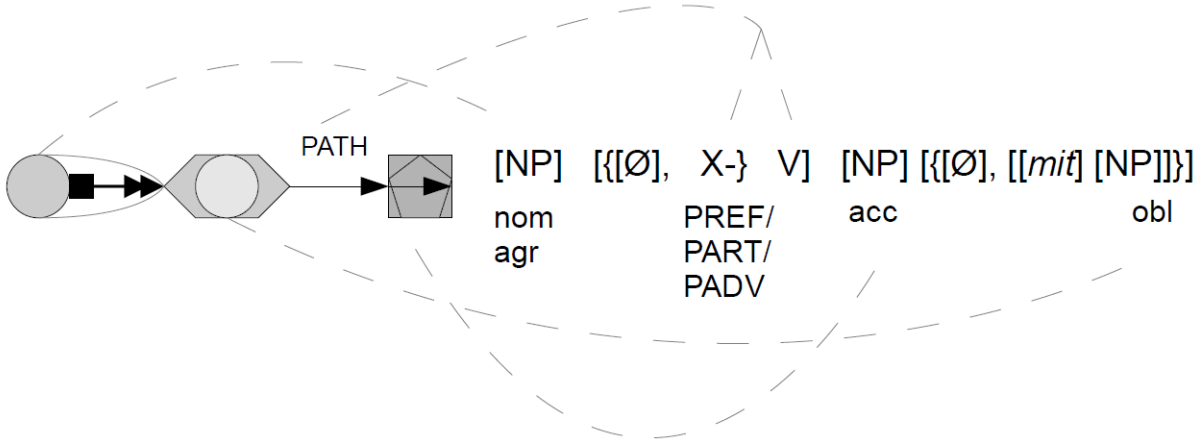


Figure 4.59: Linking schema underlying the NP_{nom}-V-NP_{acc}-P_{mit}-NP construction in the locative alternation

The first, contingent zero element in the syntactic structure in Figure 4.59 indicates the possible compression of the path expression into the verb. For instance, some verbs like *gießen* 'pour' without a path expression can also be inserted into this construction, as in *die Blumen mit Wasser gießen* 'water the flowers'. Conceptually, there is clearly a path there. Variants to the compressed path expression are the prefix, particle, or prepositional adverb attached to the verb, exemplified in (4.73b) with the prefix *be-*. The second, also contingent zero element indicates the optionality of the final PP: *Er bemalt die Wand.* 'He is painting the wall' is a well-formed sentence. However, the Figure also shows that even if there is no PP realized, there is something in conceptualization with which the wall is painted.

What is especially important is that in Figure 4.58 the object that is painted on is construed as a location landmark, while it is a location or object landmark in Figure 4.59. Why should this be the case? Remember that the status of circumstances is derivative of the status of perceptual and conceptual objects. A relation is constituted only by the states of the involved objects. Thus, conceptualizing a wall entirely painted with trees dictates that the conceptualizer verbalize this by means of the NP_{nom}-V-NP_{acc}-P_{mit}-NP construction, if this information is relevant for the message. Analogously, identifying this construction as underlying an utterance like (4.73b) indicates to the interpreter that the NP_{acc} referent is most likely holistically affected. However, it is only in a very indirect sense the case that the expression for the painted object is dependent on the circumstance. Instead, the circumstance as well as the construction are dependent on how the objects in question, and the painted object in particular, are conceptualized in the first instance – as object or location landmark. Remember that even in incrementally interpreting a single verb in a verb-first utterance (like *Bemalt…* 'paint)' it is necessary to conceptualize one or more objects prior to being able to conceptualize the circumstance designated by this verb. Thus, it is essentially the nature of the landmark in the conceptualization of circumstances underlying the locative alternation that governs the choice of the particular construction. This is what aspectual approaches to the phenomenon must take into account (cf. Dowty 1991, Tenny 1992, among others, and Levin & Rappaport Hovav 2005 for an overview).

If the above characterization is adequate, the two constructions must differ with respect to their acceptability when the nature of the landmark is systematically modulated. In particular, a landmark that is not conceptualizable as object (but only as location) and which can

therefore not be holistically affected should be prohibited in the NP_{nom}-V-NP_{acc}-P_{mit}-NP construction. I have tried to illustrate this by means of the difference between (4.74a) and (4.74b).

(4.74a) *Peter spuckt Kirschkerne in die Luft.*
Peter.3NOM spit.3 cherry-pit.ACC.PL into the.ACC air
'Peter spits cherry-pits into the air.'

(4.74b) #*Peter bespuckt die Luft mit Kirschkernen.*
Peter.3NOM HOL-spit.3 the.ACC air with cherry-pit.DAT.PL
lit. 'Peter spits the air with cherry-pits.'

The air cannot be conceptualized as being spatially delimited in a sense that would make (4.74b) acceptable. If some trajector (e.g., paint) goes "**bi*" some landmark (e.g., a wall), and if **bi* originally means something like 'directed at around x', then the distribution of the trajector (i.e., paint) may, when reaching the landmark (i.e., the wall), eventually extend the outer boundaries of the landmark (i.e., the wall's edges). This requires the identifiability of these boundaries which is not the case with air. The other way around – the NP_{nom}-V-NP_{acc}-P_{path}-NP construction with an object landmark expression – is perfectly possible, while it is trivially also possible with a location landmark.

Interestingly, we then have a similar implicational relationship between the two constructions as with the dative alternation.

With respect to the latter it has been shown that the DOC imposes additional restrictions on triadic transfer circumstances in relation to the POC in that it has an additional final sub-part which constitutes (a)symmetrical bi-directionality licensing the dative. Similarly, we can state that the NP_{nom}-V-NP_{acc}-P_{mit}-NP construction imposes additional restrictions on the kind of circumstances underlying the locative alternation in relation to the NP_{nom}-V-NP_{acc}-P_{path}-NP construction. This concerns the (presumably) definitive status of the landmark expression as object landmark that is fully affected by what the oblique NP designates. In contrast, the NP_{nom}-V-NP_{acc}-P_{path}-NP construction leaves this status undetermined just like the POC leaves undetermined the motion/movement of the addressee and with this the arrival of the transferred object at the addresse.

As a consequence, the difference between *malen* and *bemalen*, or between $paint_1$ and $paint_2$ may be deeper than usually assumed. If this is true, then this difference can presumably not be captured by the notion of profiling in CFL which leaves the nature of the landmark untouched (cf. Langacker 2000, ^{2}2002, 2008a, Croft 1991, 2001, Goldberg 1995 on the notion of profiling).

Perhaps caused by the increasing grammaticalization, i.e., desemanticization, of *be-* which makes its effect on landmarks opaque, there may be a tendency in German to use *malen* and *bemalen* synonymously. (In section 4.1.3 it has been mentioned that in many cases *be-* has already lost its conceptual import). Three examples are given below:

(4.75) *eine frei stehende Holzlatte, die […] teilweise schwarz bemalt*
a.3NOM free standing lath that partially black HOL-paint.PTCP
ist[187]
be.AUX
'a freestanding lath that is partially painted black'

(4.76) *Irgendjemand hat hier an der Straße meinen Bulli*
someone.3NOM have.3AUX here at the.DAT street my.ACC van
beschmiert[188]
HOL-smear.PTCP
'Someone smeared my bus here by the street'

(4.77) *wo man zum beispiel wie bei excel felder hat, die*
where one.3 for example like in excel field.ACC.PL have.3 DEM.ACC.PL
befüllt und sagt […][189]
HOL-fill.PTCP and say.3
'where one has fields like in Excel, for instance, (then) fills them and says…'

Concerning (4.75) and (4.77), if something is asserted to be *bemalt* 'painted' or *befüllt* 'filled' and if the interpreter takes the instruction – including *be-* – literally as a motivated mapping, then he/she would have to conceptualize this object as being painted all over and filled completely, not just *teilweise* 'partially'. Likewise, the van of the person complaining in (4.76) can be seen (on the website) to have been *beschmiert* 'smeared' only at the mud wing, but by no means all over.

4.4.6 The conative alternation

Looking at its temporal organization, the conative alternation is closely related to the dative alternation. It is also related to the locative alternation in that the landmark plays again the crucial role with respect to the question of what governs the split between the two constructions exemplified below. It differs from the locative alternation (mostly)[190] in the absence of something that changes its position ultimately (like the paint in *paint the wall*).

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[187] Kölner Stadtanzeiger 14/04/2012; <http://www.stadtanzeiger.de/servlet/OriginalContentServer?pagename=ksta/ksArtikel/Druckfassung&aid=1334354037504> [Accessed on 17/04/2012]

[188] <http://www.t5-board.de/board/threads/52096-Bulli-beschmiert-%28> [Accessed on 17/04/2012]

[189] <http://www.winfuture-forum.de/index.php?showtopic=195607> [Accessed on 17/04/2012]

[190] (4.79) gives an example of a sentence pair which ranges somewhere between the locative and the conative alternation. One could say that the conative construction (see (4.79b) and main text) shows an interesting alternation with the NP_{nom}-V-NP_{acc}-P_{path}-NP construction in the locative alternation (4.79a).

(4.79a) *Alex wirft den Ball auf Christoph.*
Alex.3NOM throw.3 the.ACC ball on Christoph.ACC
'Alex throws the ball to [lit. 'on'] Christoph.'

(4.79b) *Alex wirft den Ball nach Christoph.*
Alex.3NOM throw.3 the.ACC ball at/after Christoph.DAT

(4.78a) *Der Kardinal schlägt den Jungen.*
the.3NOM cardinal hit.3 the.ACC boy
'The cardinal hits the boy.'

(4.78b) *Der Kardinal schlägt nach dem Jungen.*
the.3NOM cardinal hit.3 at the.DAT boy
'The cardinal hits at the boy.'

The (b) variant is called "conative" construction (deriving from Latin *conor* 'try, make effort') because the NP_{nom}-V-P-NP construction in interplay with the verb codes "only" the attempt to actualize the circumstance that the verb in isolation designates. Thus, *hit at sth.* expresses the attempt to hit sth. (see Levin 1993, Goldberg 1995, 2006, Dowty 2001, Broccias 2001).
Remember that in the dative alternation the DOC has been differentiated from the POC among other things by stating that it has one sub-event more. By using the DOC the speaker conceptualizes the circumstance in a way that includes the addressee's receiving the transferred object. The circumstance coded by the POC leaves this final sub-part undetermined. Only the transferred object being on its way to the addressee is coded by that construction. In this respect the concept of the circumstance underlying the POC is contained in that of the DOC. The same can now be stated about the conative alternation.
If the cardinal hit the boy (and was attributed responsibility for that), then this entails that the cardinal also hit at the boy. The reverse case is not true. If the cardinal hit at the boy this does not mean that he actually hit him.

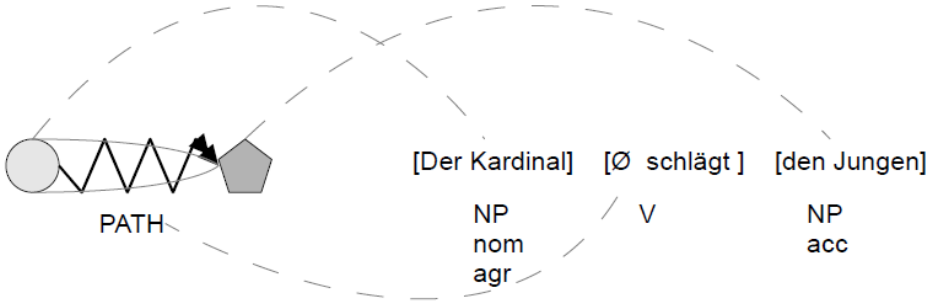

Figure 4.60: Linking schema for NP_{nom}-V-NP_{acc} construction in conative alternation

Figure 4.60 shows that the movement of the nominative referent is directed towards the accusative referent. If it succeeds, it is accompanied by exertion of force. It then constitutes the action schema of hitting someone. The result is a verbalization by means of the NP_{nom}-V-NP_{acc} construction. If, in constrast, the movement does not reach the landmark, force cannot

'Alex throws the ball to [lit. 'at'/'after'] Christoph.'

Locally, i.e., with respect to these two utterances, I cannot detect a difference in the conceptualizations underlying them. However, globally the difference between the two constructions lies in the fact that the conative construction in (4.79b) is possible only when the landmark is an object, while location landmarks also license the NP_{nom}-V-NP_{acc}-P_{path}-NP construction.

be exerted and no causation takes place. The landmark remains unaffected by the movement of the trajector. This is given in Figure 4.61.

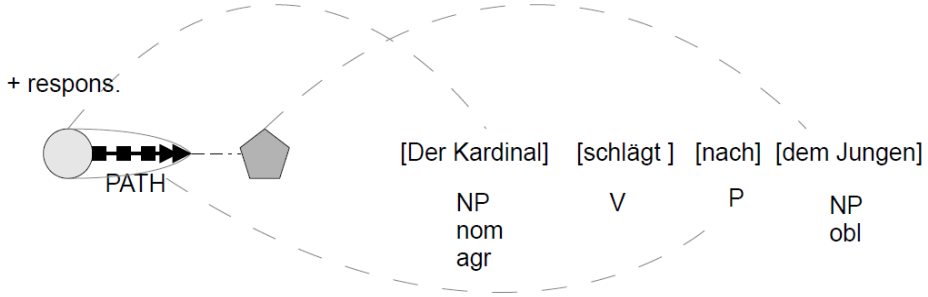

Figure 4.61: Linking schema for NP_{nom}-V-P-NP construction in conative alternation

The schematic in Figure 4.61 shall not suggest that this circumstance could not develop into one of hitting someone. In other words, *hit at someone* may code the midway to hitting someone, i.e., a middle sub-part of the action schema of hitting someone. But importantly, it can also code the failure of the action schema of hitting someone. In *The cardinal hit at him but he dived away* the hitting at the boy can only in a restricted sense be viewed as a midway to hitting him because the actualization of the latter action schema has actually failed. For another instance of the conative alternation compare (4.80) and (4.81), as well as their appendant schematics.

(4.80) *Alex zieht den Hebel (zu sich).*
Alex.3NOM pull.3 the.ACC lever (toward self.REFL)
'Alex pulls the lever.'

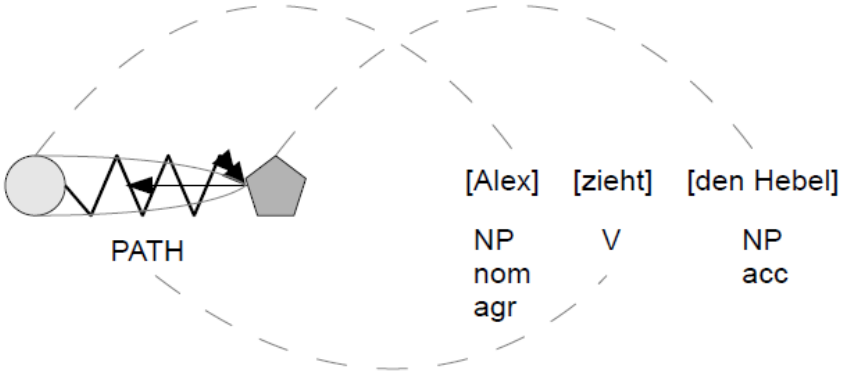

Figure 4.62: Linking schema for NP_{nom}-V-NP_{acc} construction in conative alternation

(4.81) *Alex zieht an dem Hebel (*zu sich).*
Alex.3NOM pull.3 at the.DAT lever (towards himself.DAT)
'Alex pulls at the lever.'

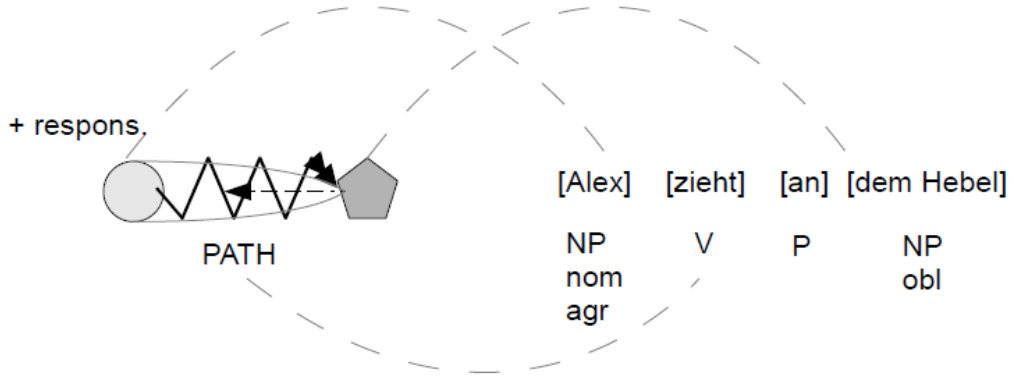

Figure 4.63: Linking schema for NP_{nom}-V-P-NP construction in conative alternation

The difference between Figure 4.62 and Figure 4.63 lies in the arrow leading from the landmark symbol (lever) towards the trajector symbol (Alex). Whereas the NP_{nom}-V-NP_{acc} construction is used for the circumstance in which the motion of the lever takes place, the NP_{nom}-V-P-NP construction is used for the circumstance in which its motion is planned but where the outcome is uncertain or irrelevant. Note that the presence of the PP *zu sich* in (4.81) would have the effect of actualizing the motion of the lever towards the puller – which is clearly contradictory to the conation coded by the NP_{nom}-V-P-NP construction.

There are several conditions on the appropriate use of the conative construction. Firstly, it is obviously the case that the object that will eventually exert force in such circumstances must be capable of conation, i.e., of trying and making effort. As such this object must be action competent in the sense that it must be able to conceptualize a circumstance that shall be brought about and for the bringing about of which some action schema(s) is/are the means. However, this action competence has in earlier sections been described to be a crucial ingredient to what is involved in the attribution of responsibility. In other words, the circumstance in (4.80) above, coded by the NP_{nom}-V-NP_{acc} construction, entails the circumstance in (4.81), coded by the NP_{nom}-V-P-NP construction, only if the moving object is attributed responsibility. If this is not the case or not possible, the conative construction is not acceptable.

Secondly, the verb in isolation (without P) must not designate a circumstance after which the landmark has some changed feature, location, or integrity than before. Furthermore, no element indicating a final result of the circumstance must be there. That means the circumstance must not be resultative. This can be shown by attaching elements to the verb coding resulting states. If they are present, the conative construction is unacceptable.

(4.82a) *Der Jäger erschlägt den Hasen.*
the.3NOM hunter RESLT-hit.3 the.ACC hare
'The hunter batters the hare to death.'

(4.82b) **Der Jäger erschlägt nach dem Hasen.*
the.3NOM hunter RESLT-hit.3 at the.DAT hare
lit. 'The hunter batters at the hare to death.'

(4.83a) *Der Jäger schlägt den Hasen tot.*

the.3NOM hunter hit.3 the.ACC hare dead.RESLT
'The hunter batters the hare to death.'

(4.83b) **Der Jäger schlägt nach dem Hasen tot.*
the.3NOM hunter hit.3 at the.ACC hare dead.RESLT
lit. 'The hunter batters at the hare to death.'

The reason is that the circumstance coded by the conative construction is open at its "back end", either because the information about how it works out is irrelevant or because it is unknown. Anyway, if there is a syntactic unit coding a resultant state with respect to the circumstance coded by the verb (stem), the final state that is actually unknown or irrelevant is asserted.
Thirdly, the circumstance underlying the conative construction must exhibit exertion of force (which does not imply change of feature/location/integrity) between the moving thing and the landmark carried out in the pursued circumstance. For this to happen movement/motion must also apply. This may be fictive or concrete motion/movement. In (4.84a) below it is exemplified by fictive movement/motion. Contact is constituted here by the sub-part of the circumstance in which the fictive motion/movement of the trajector's eye gaze "hits" the landmark in its conceptual field. As a consequence, it is undetermined whether the cardinal in the (b) variant will actually see the boy – he tries to see him.

(4.84a) *Der Kardinal sieht den Jungen.*
the.3NOM cardinal see.3 the.ACC boy
'The cardinal sees the boy.'

(4.84b) *Der Kardinal sieht nach dem Jungen.*
the.3NOM cardinal see.3 at the.DAT boy
'The cardinal looks where the boy is.'

It is not by coincidence that *nach jmd. sehen* (lit. 'look after s.o.') is also often interchangeable with *jmd. suchen* 'look for s.o.'.
Many proposals concerning English grammar and dealing with the conative alternation treat sentence pairs like *Alex eats the cake* and *Alex eats at the cake* as instances of the conative alternation. A pair like this resembles the conative construction with respect to the alternation between an adverbal accusative complement and a complement that is governed by *at*, the verb itself being equal across the constructions. Although there are similar conditions on the use of this alternation as on that of the conative alternation with respect to their temporal organizations, this treatment is problematic from a spatial-conceptual and especially from an actional standpoint (see also Broccias 2001). This is why examples like the above will be dedicated a separate section as partitives.

4.4.7 The partitive alternation

Consider the following sentence pairs and the appendant Figures, respectively.

(4.85a) *Alex liest das Buch (durch).*
Alex.3NOM read.3 the.ACC book (through)
'Alex reads the book completely.'

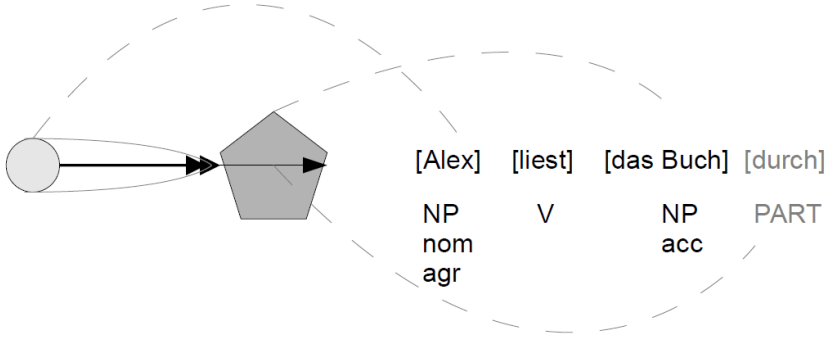

Figure 4.64: Linking schema for NP_{nom}-V-NP_{acc} construction in partitive alternation

(4.85b) *Alex liest an/in dem Buch (*durch).*
Alex.3NOM read.3 at/in the.DAT book (through)
'Alex reads in the novel.'

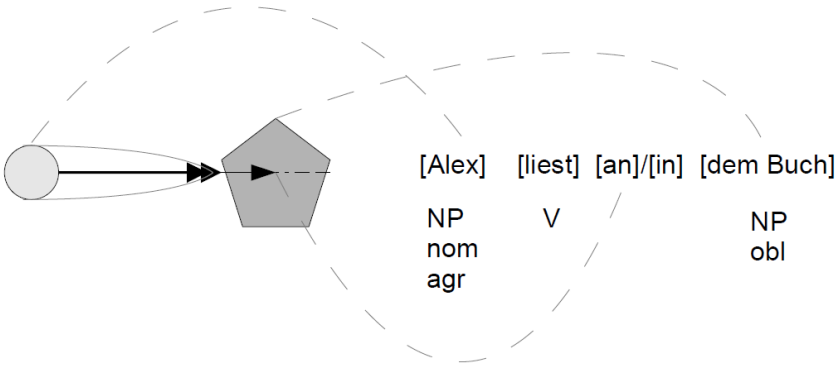

Figure 4.65: Linking schema for NP_{nom}-V-P-NP construction in partitive alternation

(4.86a) *Philipp schreibt seine Dissertation.*
Philipp.3NOM write.3 his.ACC dissertation
'Philipp writes his dissertation.'

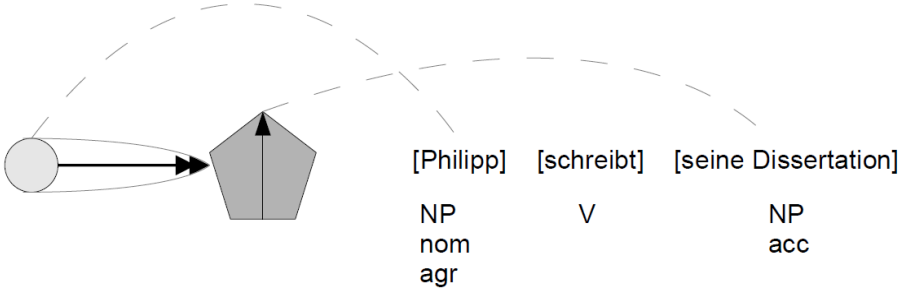

Figure 4.66: Linking schema for NP_{nom}-V-NP_{acc} construction in partitive alternation

(4.86b) *Philipp schreibt an seiner Dissertation.*

Philipp.3NOM write.3 on his.DAT dissertation
'Philipp writes on his dissertation.'

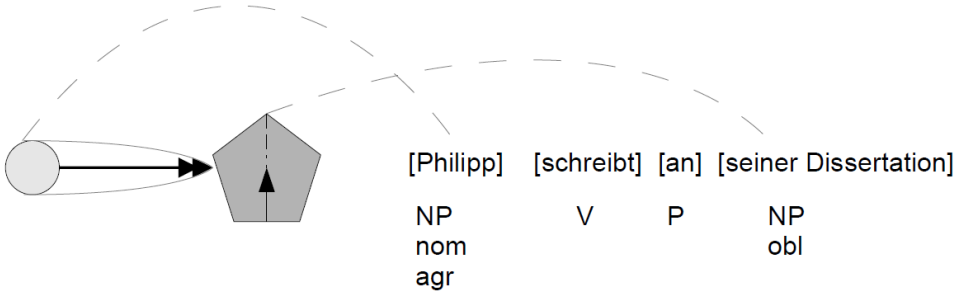

Figure 4.67: Linking schema for NP_{nom}-V-P-NP construction in partitive alternation

(4.87a) *Hans baut ein Baumhaus.*
Hans.3NOM build.3 a.ACC tree-house
'Hans builds a tree house.'

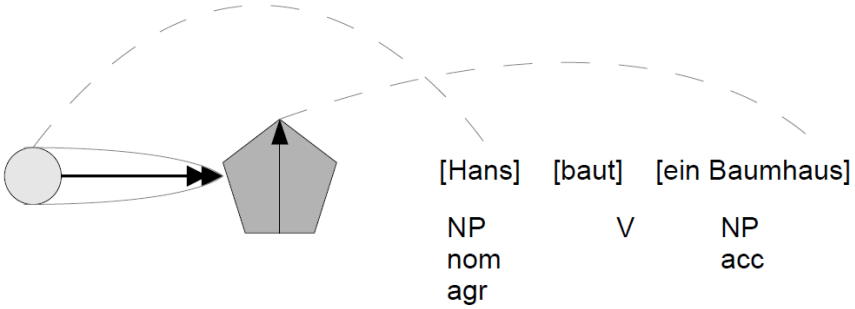

Figure 4.68: Linking schema for NP_{nom}-V-NP_{acc} construction in partitive alternation

(4.87b) *Hans baut an einem Baumhaus.*
Hans.3NOM build.3 on a.DAT tree-house
'Hans builds a tree house.'

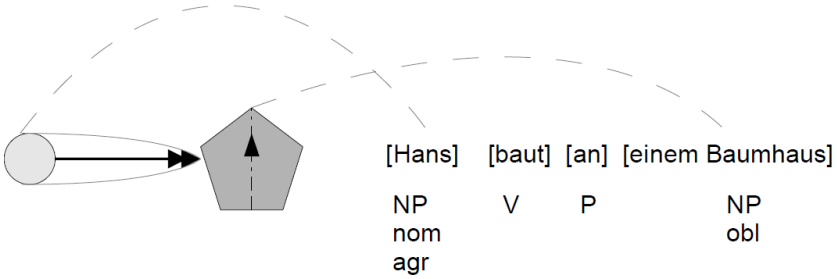

Figure 4.69: Linking schema for NP_{nom}-V-P-NP construction in partitive alternation

The circumstances underlying the (a) and (b) sentences above are long-term activities. If coded by means of the NP_{nom}-V-NP_{acc} construction as in the (a) variants, the final sub-parts of these circumstances are constituted by their respective landmark objects having gained or lost integrity and identity in terms of the noun referring to these objects. If coded by means of the *NP_{nom}-V-P-NP* construction as in the (b) variants, the final sub-parts of these circumstances are constituted by their respective landmark objects gradually gaining or losing parts of a

whole (and ultimately integrity) and thus identity in terms of the noun referring to these objects.

In the case of (4.85b) the activity takes place with respect to a part of the whole being metaphorically consumed. Like in the conative alternation, the trajector's movement/motion must make contact with the landmark.

The preposition *an* in the (b) variants does not really code a spatial relation, e.g., the location where the circumstance expressed by the verb takes place. I would suggest is that this is not a motivated construction. In particular I would suggest that it is no longer a motivated structure. One can imagine that it once was, when *an* in fact designated a spatial relation, namely that between the activity of a trajector (let us say Hans) and the location landmark where the activity took place (i.e., Hans building a tree house somewhere). It is conceivable that the location where Hans was building the tree house once ultimately became occupied by an object, namely the tree house itself. In this way, the location became identified with the object that gradually filled it by having been built. Grammatically, the continuous or iterative and temporally distributed activity of the trajector (i.e., Hans) at the location landmark may have been compressed in a way that resulted in the occupation of the product of the activity (i.e., the tree house) in the syntactic position of the location where the activity (i.e., building sth.) took place. The final result of these compression processes is a partitive conceptualization: The preposition phrases consisting of [*an* NP] in the (b) sentences above can always be paraphrased with [*etwas von NP*] 'some part of NP' which in many languages is expressed by partitive case forms.

This is where the partitive alternation differs from the conative alternation in a crucial respect: Where the conative construction codes the effort to succeed in the circumstance that is coded by the NP_{nom}-V-NP_{acc} construction, the circumstance coded in the partitive construction actually succeeds, even though not completely, i.e., the circumstance to be realized is not yet brought about. However, the ancillary action schemas which constitute the trajector's activity are not failed instances of actualizing the action schema designated by the verb, as may be the case in the conative alternation: *nach jmd. schlagen* 'hit at s.o.' may designate the failure in the attempt to actualize the action schema of hitting someone, whereas *an etw. schreiben* 'write on something' does not designate the failure in the attempt to actualize the action schema of writing something.

Although the following example differs from the previous ones with regard to definiteness/individuation and the fact that the landmark is the PSC, whereas the trajector occurs in the partitive phrase, it is clearly a partitive construction. I am not even sure whether the attribution of responsibility is necessary in the partitive construction, which would not be surprising given its "mere" conceptual characterization.

(4.88a) *Der Reifen/Teich verliert Luft/ Wasser.*
The.3NOM tire/ lagoon lose.3 air.ACC/water.ACC
'The tire loses air/The lagoon loses water.'

(4.88b) *Der Reifen/Teich verliert an Luft/ Wasser.*
The.3NOM tire/ lagoon lose.3 on air.DAT/water.DAT

‘The tire loses (some of its) air/The lagoon loses (some of its) water.’

Interestingly, the German particle *herum-* ‘around’, if attached to a verb, takes (provisorily spoken) the presence of a final state away from the conceptualization of the underlying circumstance, i.e., there will not be a final state conceptualized if the utterance contains a verb prefixed with *herum-*. Attaching *herum-* to some German verbs thus results in the acceptability of the otherwise unacceptable partitive constructions.

(4.89) *Er streichelt/küsst/rasiert an der Statue *(herum)*[191].
He.3NOM caress/ kiss/ shave.3 on the.DAT statue (around)
‘He caresses/kisses/shaves around on the statue.’

The immediate cause of the acceptability of (4.89) does not seem to be the lack of a destination, but rather the conceptualization of the landmark as a location of which only a part is affected by the activity of the trajector. Only when something is spatially extended to a sufficient degree one can ‘verb around on/at a part of it’ and make this a long-term activity. If conceptualized as a holistically affected object landmark, there must be very special conditions met in order to make the partitive construction acceptable. This is illustrated in Figure 4.70 below which concludes this section.

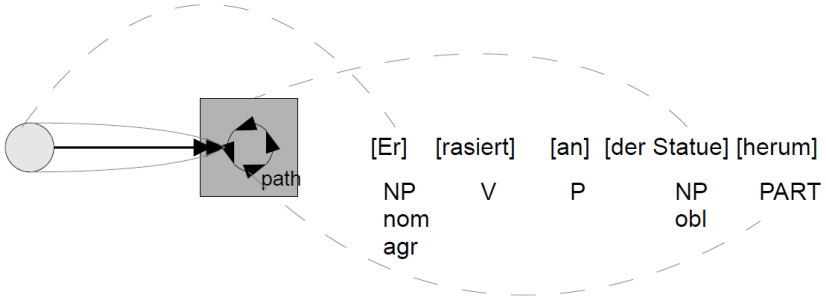

*Figure 4.70: Linking schema for NP_{nom}-V-P-NP-*herum *subtype of partitive construction*

4.4.8 Resultative constructions

The resultative construction shall be discussed rather briefly. One can guess that the role of the landmark will be of some importance here again. For the dative, locative, conative, and partitive alternations it has been demonstrated that one of the respective constructions in the alternations lacks a definitive resulting stative circumstance as a final sub-part, and that this depends on how the landmarks are conceptualized, respectively.

More precisely, there is a fundamental difference between object and location landmarks that has to do with their affordances: Only objects afford movement/motion in any conceivable manner, whether along particular paths or to particular destinations, or change of feature or

[191] The expression between a pair of parentheses is optional. An asterisk preceding the expression inside the parentheses [x (*y) z] indicates the unacceptability of the expression between parentheses in this utterance. An asterisk preceding the left parenthesis [x *(y) z] indicates the unacceptability of the utterance if the expression in the parentheses is absent.

location by means of undergoing exertion of force. This difference becomes important with respect to the resultative construction which is illustrated by (4.90a) to (4.90f).

The resultative construction is exemplified by the first sentence.

(4.90a) *Der Jäger schießt den Hasen tot.*
the.3NOM hunter shoot.3 the.ACC hare dead.RESLT
'The hunter shoots the hare dead.'

(4.90b) *Der Jäger schießt auf den Hasen (*tot).*
the.3NOM hunter shoot.3 at/on the.ACC hare (dead.RESLT)
lit. 'The hunter shoots at the hare (dead).'

(4.90c) *Der Jäger erschießt den Hasen (*tot).*
the.3NOM hunter RESLT-shoot.3 the.ACC hare (dead.RESLT)
lit. 'The hunter shoots-dead the hare (dead).'

(4.90d) *Der Jäger erschießt (*auf) den Hasen.*
the.3NOM hunter RESLT-shoot.3 (at/on) the.DAT hare
lit. 'The hunter shoots-dead (at) the hare.'

(4.90e) *Der Jäger beschießt den Hasen (*tot).*
the.3NOM hunter HOL-shoot.3 the.DAT hare (dead.RESLT)
lit. 'The hunter shoots toward the hare (dead).'

(4.90f) *Der Jäger beschießt (*auf) den Hasen.*
the.3NOM hunter HOL-shoot.3 (at/on) the.DAT hare
lit. 'The hunter shoots toward (at) the hare.'

In (4.90a) there are two circumstances (i.e. two conceptualizations) compressed into one sentence. First of all there is the activity of shooting by the hunter and secondly the dying or being dead of the hare. The same can be said about the well-formed variant (4.90c)/(d). In the well-formed variants of the other sentences (4.90b) and (e)/(f) there is only the activity of shooting with an uncertain or irrelevant outcome. One can ask now (i) what the difference between the sentences with a resultant state is, (ii) what the difference between those without a resultant state is, and (iii) why adding the expressions in parentheses make all of them unacceptable.
(i) The difference between (4.90a) and (c)/(d) lies in the fact that the death of the hare is not the only possible result of the shooting activity in (a) but that this is the necessary result of *erschießen* 'RESLT-shoot' in (c)/(d). The prefix *er-* goes back to Germanic **uz-* (Goth. *us* 'away from sth.', esp. 'from inside to ouside, up from below'), lost its spatial meaning relatively early in favor of a temporal one, so that the position in space of some movement/motion got replaced by the "position in time" where the motion/movement ends. This is the resultant, i.e., final sub-part of a circumstance that is largely determined by the

concept underlying the verb stem. Where *er-* today still contributes to the conceptualization underlying some verb stem it can thus be paraphrased as 'indicating the result of the circumstance designated by the verb stem'. Because "result" is theoretically vague, it can be reconstructed here by means of the action theoretical notions introduced in section 2.4: Result in this context means the outcome of the actualization of a circumstance schema, given that the actualization is successful.

In the case of *schießen* death is the outcome the actualization of the action schema. Linguistically^{o}, this finds its expression in the conservative hunter's jargon: *etw. geschossen haben* 'having shot sth.' means that the once animate object is dead now. (In the German Standard variety this construction with *schießen* is rather rare.) As a consequence, the landmark in the circumstance verbalized by means of *erschießen* is dead if the action succeeds. The landmark in the NP_{nom}-V-NP_{acc}-ADJ construction (4.91c)/(d) may also be dead (as in (4.90a)), but the result may also be another one. Because the respective adjectives for animate objects are difficult to find, (4.91) uses an inanimate object landmark:

(4.91) *Der Jäger schießt die Statue kaputt/entzwei*.
the.3NOM hunter shoot.3 the.ACC statue broken.RESLT
'The hunter shoots the statue to pieces.' (lit. 'broken')

If *erschießen* enforces the death of the shot object, then it should be unacceptable to use it with an inanimate object landmark. What happens to such an object depends rather on its affordances than on the action schema designated by the verb.

(4.92) $^{\#}$*Der Jäger erschießt die Statue*.
the.3NOM hunter RESLT-shoot.3 the.ACC statue
'The hunter shoots the statue.'

(ii) The difference between (4.90b) and (e)/(f) is obviously that of a locative alternation. However, it differs from the examples with *malen/bemalen* 'paint' in section 4.4.5, namely in the way the prefix *be-* interplays with the conceptualization underlying the verb stem *schieß-*. To be precise, the hare in (4.90e)/(f) need not at all be hit by the shot. What does that mean with respect to the holistic affection of the object landmark in constructions with *be-*? I would suggest that the hare, as object landmark in the shooting event is still holistically affected, but in the sense *be-* originally indicates, namely 'directed at around x'. This is – in a slightly stylized manner – depicted in Figure 4.71. That *beschießen* can indicate that multiple shots are fired (shooting is iterated) could originate in the 'around x' conceptualization underlying *be-*, because a single shot can hardly accomplish this holistic affection. Thus, (4.90e)/(f) compress multiple actions into a single construction.

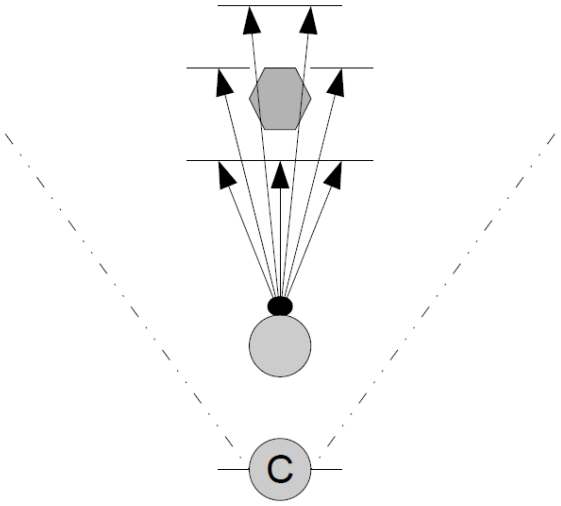

Figure 4.71: Conceptualization underlying beschießen *'HOL-shoot' event*

In contrast, with the construction underlying (4.90b) the hare may remain unharmed too, but only because this construction does not code a situation in which the shooting results, but a conation. This is indicated by Figure 4.70 which is modelled similarly to Figure 4.69.

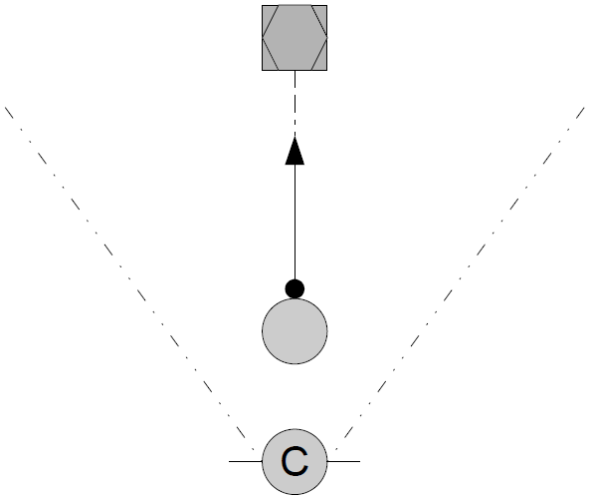

Figure 4.72: Conceptualization underlying schießen auf *'shoot at' event*

(iii) Sentences (4.90b) to (f) become unacceptable if the expressions in parentheses occur in them, respectively. (4.90b) without the addendum is a conative construction and renders the result of the activity irrelevant or uncertain. It is thus conceptually/actionally incompatible with a resultative phrase. In (4.90c) the verbal prefix *er-* already instructs the interpreter to conceptualize the landmark as dead, as has been argued. Its change of state cannot be conceptualized twice, as the final adjective would require. In (4.90d) the PP headed by *auf* 'at/on' renders the outcome of the activity of shooting at the hare uncertain. It is open at the end and can even be continued. The prefix *er-* on the verb is incompatible with this conceptualization because it instructs one to close the circumstance by means of a final sub-part in which the hare is dead. Concerning (4.90e), the conceptualization in Figure 4.71 shows that *be-* does not enforce the conceptualization of a resulting state in the landmark but even renders the activity imperfective by compression which makes it incompatible with a

resultative phrase. And in (4.90f) the *be-* prefix already instructs the interpreter to conceptualize the path of shooting as being directed towards (around) the landmark. The PP headed by *auf* is thus incompatible with it.

4.4.9 Weather verbs

Most grammar or syntax textbooks on German dedicate special attention to weather verbs, since they show some special syntactic behavior (e.g., Eisenberg 1999, Hentschel & Weydt ^{3}2003, Eroms 2005, Fleischer & Schallert 2011). In fact, this is a cross-linguistically observable phenomenon (e.g., Jones 1996: 66f., Hualde & Ortiz de Urbina 2003: 377f.). In particular, many languages to which German belongs express weather circumstances by means of verbs. Within the tradition of Chomskyan Linguistics the co-occurring PSCs of these verbs are often assumed to be "thematically" empty and to be syntactically required (*#wer/was regnet* 'who/what is raining'). Cognitive linguists are rather skeptical about these assumptions and consider the so-called expletive pronoun PSC "meaningful" (e.g., Smith 2002). If Chomskyan linguists are right, the syntactic behavior of weather verbs is independent of actional, perceptual, and conceptual foundations of verb-complement structures, belongs to the idling cycle of the symbol system (see section 3.3.8), and thus lies outside the scope of this work. If Cognitive linguists are right, one should find some motivation in the mapping between conceptualization and syntactic structures with respect to weather circumstances. Let us first assemble some linguistic^{o} evidence. The following examples suggest that the expletive pronoun *es* 'it' is not a mere syntactic dummy.

(4.93) *[…] ich war froh, daß es danach in Strömen geregnet und mir den*
I was happy that it after-that cats-and-dogs rained and to-me the
Radlauf und Unterboden abgespült hat.[192]
wheel-arch and undercarriage rinse-out has
lit. 'I was happy that it had rained after that and rinsed out the wheel-arch and undercarriage of my car.'

(4.94) *[…] es hat gestürmt und den Regen gegen das Fenster gepeitscht.*[193]
it has stormed and the rain against the window slashed
'It was storming and slashed the rain against the window.'

(4.95) *Es hat geregnet und den ganzen Schnee weggespült.*[194]
it has rained and the entire snow washed-away
'It rained and washed all the snow away.'

[192] <http://www.golfcabrio.de/forum/archive/index.php/t-78968.html> [Accessed on 20/04/2012]

[193] <http://remstalhoehenweg.blogspot.de/2012/01/regen-und-schnee.html> [Accessed on 20/04/2012]

[194] <http://www.weightwatchers.de/community/mbd/post.aspx?threadpage_no=1&page_size=25&rownum=11&board_name=Unter+Freunden&thread_id=126685931&board_id=8&forum_name=forum&forum_id=1&thread_name=***Star+Trek+meets+WW+am+18.01.10***&mod_no=&sincedate=05.01.2010+00%3A00%3A00&viewchange=DATECREATEDDESC> [Accessed on 20/04/2012]

(4.96) *[…] es hat geregnet und den losen dreck in den teich geschmissen […]*[195]
it has rained and the loose dirt into the pond thrown
'It rained and washed the loose dirt into the pond'

(4.93) to (4.96) each contain coordinated clauses. In the first clause of each sentence a weather verb occurs with a PSC considered an expletive *es* 'it'. In the respective coordinated clauses the PSCs are quite regularly left out. The verbs in the coordinated sentences are not weather verbs but verbs whose conceptualization includes motion and/or exertion of force by a trajector, and thus should require "thematic" or "meaningful" PSCs – but which they obviously do not have.
On the basis of these data is difficult to decide whether *es* is – somehow – referential in both clauses of each sentence or whether the verbs in the second clauses of the sentences can be expressed without their referential PSCs and take an expletive *es* instead, just like the weather verbs. One can state, however, that in sentences like *Mir hat es den Radlauf und Unterboden abgespült*[196] 'It has rinsed out the wheel-arch and undercarriage of my car' one can ask the question of what (*was*) has done this.
In the face of the insights in auxiliary choice (see section 4.4.2) one can ask what motivates the auxiliary choice in weather verb constructions. Consider (4.97) to (4.99). Note that I have added conceptual subscriptions to parts of the construction.

(4.97) Es_{expl} $regnet_{\text{motion+manner}}$ $Frösche_{\text{tr}}$.
it.3EXPL rain.3 frogs
'It is raining frogs.'

(4.98) Es_{expl} *hat* $Frösche_{\text{tr}}$ $geregnet_{\text{motion+manner}}$.
it.3EXPL has.3AUX frogs rained
'It has rained frogs.'

(4.99) *$Es_{\text{Vf-}es}$ *sind/* *Es_{expl} *ist* $Frösche_{\text{tr}}$ $geregnet_{\text{motion+manner}}$.
it.3SGVFES are.3AUX/it.3SGEXPL is.3AUXfrogs.PL rained

The sentences illustrate that if it rains or if it rains something, a form of 'have' is chosen as auxiliary. According to the regularities of auxiliary selection, this predicts a causative circumstance, an "existence of state", an "uncontrolled" or a "controlled process". I think we can exclude on relatively safe grounds that there is a controlled process underlying (4.97) and (4.98). An argument against the existence of a state is that something is actually happening when it is raining. Thus, we presumably deal with an uncontrolled process or a causative circumstance. Uncontrolled processes are expressible by monadic constructions, where the involved objects are realized by the PSC. This does not work, as (4.100) illustrates.

[195] <http://www.spielerboard.de/allgemeine-diskussionen/247495-teich-im-garten-2.html> [Accessed on 20/04/2012]
[196] I wanted to avoid beginning this sentence with *Es hat* 'It has' because this would have shifted the expletive *es* to a so-called "Vorfeld-*es*" ('prefield', according to the theory of topological fields).

(4.100) #*Frösche regnen*$_{\text{motion+manner}}$.
frogs.3 rain.3
'Frogs are raining.'

Treating (4.98) as a causative construction, we can make the underlying circumstance complex and conceptualize it as including a change of state in the added landmark. This should allow us to passivize the sentence. If it works, it is a causative construction.

(4.101) *Es*$_{\text{expl}}$ *hat* *Frösche*$_{\text{tr}}$ *auf*$_{\text{direction}}$ *mich*$_{\text{lm}}$ *herab*$_{\text{path}}$ *geregnet*$_{\text{motion+manner}}$.
it.3EXPL has.3AUX frogs on me down-rained
lit. 'It rained frogs down on me.'

(4.102) #*Frösche*$_{\text{tr}}$ *sind* *auf*$_{\text{direction}}$ *mich*$_{\text{lm}}$ *herab*$_{\text{path}}$*geregnet*$_{\text{motion+manner}}$ *worden.*
frogs.3 are.3AUX on me down-rained were.AUX.PTCP
lit. 'Frogs were rained down on me.'

Thus, it seems it is not a causative construction. However, it behaves like one in other respects. Remember that in triadic causative constructions the selected auxiliary is that which would be chosen if only the first sub-part of the causative circumstance would be verbalized. This is always an "(un)controlled process" in which the trajector is involved. Now, if we take the object exerting force away from the causative circumstance and if the second and third sub-parts of the causative circumstance include a change of location or state, then this would be expressible by a form of 'be' as auxiliary. This is indeed already implicit in (4.102) and now explicated in (4.103).

(4.103) *Frösche*$_{\text{tr}}$ *sind* *auf*$_{\text{direction}}$ *mich*$_{\text{lm}}$ *herab*$_{\text{path}}$*geregnet*$_{\text{motion+manner}}$.
frogs.3 are.3AUX on me down rained
'Frogs were raining down on me.'

Adding *es* to the construction in (4.103) does not result in an expletive construction but rather in one with a *Vorfeld-es* (given in (4.104)). And because it still involves a change of location, it is perfectly okay – in opposition to (4.99) above. For the same reasons (4.105) is also okay – in opposition to (4.100) above.

(4.104) *Es*$_{\text{Vf-es}}$ *sind* *Frösche*$_{\text{tr}}$ *auf*$_{\text{direction}}$ *mich*$_{\text{lm}}$ *herab*$_{\text{path}}$*geregnet*$_{\text{motion+manner}}$.
it.3SGVFES are.3PL.AUX frogs.3PL on me down-rained
'There were frogs raining down on me.'

(4.105) *Frösche*$_{\text{tr}}$ *regnen*$_{\text{motion+manner}}$ *auf*$_{\text{direction}}$ *mich*$_{\text{lm}}$ *herab*$_{\text{path}}$.
frogs rain on me down
'Frogs are raining down on me.'

Thus, weather verb constructions resemble causative constructions in certain respects, but differ from them in others. The factors that make them different make (4.100) and (4.102)

unacceptable. (4.99) is unacceptable by independent reasons. In what follows the former factors shall be isolated. When examining possible actional, perceptual, and conceptual causes for the special behavior of weather verbs, one cannot avoid taking the entities involved in weather circumstances into account.

From a perceptual and conceptual point of view, objects in weather circumstances are mostly not figure-apt. As such, they cannot serve as trajectors in conceptualization. In section 3.1 I outlined how gestalt laws help perceivers "build" a figure as a whole from basic visual features, and how they help determine the spatial relationship of a figure in reference to a ground, i.e., to determine in which relation the figure stands to what else is in the visual field. A "good" figure was characterized as an integration of visual features which are proximate to each other, similar to each other, constituting well continuing lines, exhibiting closure, and which are moving together. The segregation of a figure from a ground is facilitated by the smallness of a figure and the movement/motion of a figure relative to a ground. The importance of foveal seeing in the identification/categorization of stimuli has also been outlined. Most of these properties do not apply to what we call *rain* in raining, *snow* in snowing, *storm* in storming, *drizzle* in drizzling, or *hail* in hailing circumstances. That means there is something in the visual/conceptual field that cannot be singled out as figures, i.e., as trajectors and object landmarks. There can thus be no affordances – e.g., no exertion of force – as long as the stimuli in our visual/conceptual do not become more individuated and thus somehow more figure-apt.

I ascribe the unacceptability of (4.100) to the lack of figure-aptness of the designata of *rain* in raining, *snow* in snowing, and so on. That makes these nouns suspicious of being hypostatizations – pretending to designate objects by being a noun while actually coding whole circumstances –, but that need not be the case: Rain, snow, etc. can actually assume object features, namely rain (or water) and snow as results of raining and snowing, respectively. In opposition to being amorphous, non-individuated masses, amounts of rain, snow etc. may at least partially get spatial delimitations, i.e., perceivable edges, in particular there where the products of raining, snowing and so on aggregate or pile up somewhere. The fact that *rain* may refer to the fairly individuated result of raining may also contribute to the unacceptability of (4.100): The sentence would have to be interpreted such that the process was identical with its result. Another consequence is that snow and water aggregations (e.g., snow heaps, puddles of water) may afford circumstances to actors/cognizers, among them exertion of force. If interpreted as results of the respective processes of raining, snowing and so on, and as having a certain amount and spatial delimitations, the PSC NPs in (4.106) need not be hypostatizations but may refer to fairly regular trajectors. An exception is *Niesel* 'drizzle', since it is unusual if not impossible to designate the result of *nieseln* 'drizzle', perhaps because it describes a manner of raining.

(4.106) *Der Regen/Schnee/Hagel/?Niesel hat mir die*
the.3NOM rain/ snow/ hail/ drizzle have.3AUX me.DAT the.ACC.PL
Pflanzen kaputt gemacht.
plant.PL broken make.PTCP
'The rain/snow/hail/drizzle destroyed my plants.'

The regular status of the trajectors (except *Niesel*) should in turn license the passivization of these sentences: The trajectors exert force on the landmark so that it undergoes a change of features (here: losing integrity/identity).

(4.107) *Die Pflanzen sind mir vom Regen/Schnee/Hagel/*
the.3NOM.PL plant.PL be.3AUX me.DAT by-the.DAT rain/ snow/ hail/
?Niesel zerstört/bedeckt worden
drizzle destroy/cover.PTCP was.AUX.PTCP
'The plants were destroyed/covered by the rain/wind/hail/drizzle.'

(4.106) demonstrates that the result of a weather circumstance may exert force on something. However, this still does not answer the question as to whether this result itself is caused by something which is expressed by *es* 'it', e.g., in (4.101).
The comparisons of sentences (4.93) and (4.96) on the one hand, and (4.101) and (4.102) on the other, yield no clear-cut picture, suggesting that with weather verbs the relationship between semantics and syntax is not as regular as with respect to other phenomena. A tentative explanation could be a mismatch between the diachronic motivation of the expletive *es* in weather verb constructions and the way in which it is actually interpreted and used by speakers of German today.
Concerning diachrony, there are some clues that point to rather formal causes in the development of the expletive *es* (cf. Dal ^{3}1966: 166ff., Fleischer & Schallert 2011: 213ff.). Around the time of Old High German it seems to have appeared at first in the syntactic prefield of sentences with weather verbs. Such uses existed alongside subjectless uses of weather verbs at that time. Other old languages of the Germanic branch used complements in instrumental case together with weather verbs. From the prefield the expletive then found its way into other constructions and syntactic positions.
Concerning interpretation and conceptualization, evidence like that in (4.93) to (4.96) and the perceptual considerations above point to the fact that cognizers conceptualize weather circumstances as being somehow caused, but without conceptualizing any causer. This may sound rather metaphysical, but it simply concerns a causer that cannot be detected. In other words, weather circumstances cannot be closed at the front end, but at the same time cognizers refuse to believe them to be uncaused. Forgetting about the expletive for a moment, what would be a motivated manner of coding the single complement of a weather verb? Emphasizing the fact that weather circumstances have some causal power while at the same time being caused suggests a causally intermediate status. Such objects are coded by instrumental case in many languages. This strategy was used in Germanic (see above). Emphasizing the "undetectable causer", gods come to mind. And indeed, in ancient Greek, for instance, Zeus may rain (*Ζεῦς ὕει* 'Zeus rains'; e.g., *Iliad*, 12, 25f.). For syntactic and historical reasons, neither coding strategy is available in New High German.

To cut a long story short, I think the expletive *es* in weather constructions is originally, i.e., historically, a syntactic (or information-structural) dummy but due to the cognizer's universally valid attempt to close circumstances at the front – which is not possible in weather circumstances for perceptual reasons – the expletive pronoun may be exceptionally used, or as

one could say, conceptually occupied in order to satisfy the responsible causer preference (RCP) which results in utterances like (4.93) to (4.96) and explains the partial pseudo-causative behavior of weather verbs and the expletive *es*.

I think one must especially appreciate the power of the RCP here. Remember the discussion of how causes are identified by self-serving pragmatics (section 3.2.1.4): Sometimes any explanation (i.e., cause) will suffice, irrespective of its scientific plausibility.

4.4.10 A note on coercion

A last phenomenon that shall only briefly be mentioned is often called "coercion" or "type coercion" (cf. Pustejovsky 1995). It refers to the phenomenon that words of specific categories may be coerced into other categories, as is exemplified in (4.108) and (4.109) (examples adapted from Goldberg 1995 and Kaplan 1975)

(4.108) *Alex niest die Serviette vom Tisch.*
Alex.3NOM sneeze.3 the.ACC napkin off-the.DAT table
'Alex sneezes the napkin off the table.'

(4.109) *Kaplan russellt einen Frege-Church.*
Kaplan.3NOM russell.3 a.ACC Frege-Church.
'Kaplan russells a Frege-Church.'

In both sentences, the verbs are used as belonging to categories which they "actually" do not belong to. *Niesen* 'sneeze' is traditionally supposed to be a monadic verb, and *russelln* 'russell' is not traditionally a verb at all.

The case of *niesen* is easy. For Alex to be identified as being in a circumstance of sneezing, he must engage in a stationary activity (probably behavior, but responsibility may be attributed) but must also emit sound or at least cringe. He may also emit a burst containing air and maybe fluids. The emission is spatially and temporally contiguous to the motion of the napkin (which affords motion due to its features), and, if fluid plays a role, contact may also be recognizable. The relationship between the activity of Alex and the motion of the napkin is thus identified as a causal one. The construction underlying (4.108) with a causative reading is thus perfectly derivable from the features and affordances of the involved objects. What is not derivable, however, is that both the monadic and the causative sneezing activities are coded by a single form, namely *niesen* 'sneeze'. As examples like *fallen* 'fall' and *fällen* 'fell' as 'cause to fall' illustrate, this need not be the case.

Russelling a Frege-Church means – as I take it – applying ideas of one philosopher – Russell – to the ideas of another philosopher – Frege – whose ideas have already been applied to (or adopted by) a third philosopher – Church. The first "application" is done by a fourth philosopher – Kaplan. However, not knowing that these persons are philosophers with competing ideas leads to a situation where (4.109) can be interpreted in various ways. For instance, meyering Smith does not necessarily mean that the ideas of Meyer are applied to Smith. But what causes exactly this conceptualization when using *Russell* as a verb is that we

know that Russell's main activity was thinking about philosophical problems and generating ideas. If the main activity of Meyer was that of hating meat eaters, meyering Smith would presumably mean applying the attitude of hating meat eaters to Smith, so that Smith changes his/her attitude towards hating meat eaters.

In other words, the most prominent or pertinent affordance of the "coerced" object is conceptualized as affecting another object by means of the exertion of force of a part or feature of the first object, mostly by means of emitting it forcefully.[197] This is the same principle as in making a verb *hammer* out of the noun *hammer* or a verb *color* out of the noun *color*. And if the landmark is conceptualized to change some feature, position, or its integrity, the utterance is interpreted to code a causative relation.

It is thus once more the features and affordances of the involved objects and the spatio-temporal constitution of their activities and processes that restrict the range of coercions that they may undergo (see also Kaschak & Glenberg 2000). Russelling someone, coloring something, hammering something, and sneezing something off something is possible only because Russell, color, hammer, and sneezer afford affecting something physically or psychically by means of a literal or metaphorical forceful emission: in the case of the hammer some kind of inalienable emission, in the other cases alienable emission, but in any case involving their most prominent affordances, respectively.

4.5 Future prospects: predictions and consequences

In this section, I will present a selection of possible predictions and consequences that can be derived from Instruction Grammar as presented in this book. They are considered to be falsifiable by means of empirical research. In this way the theory from which these predictions are derived can in principle be evaluated against other theories making falsifiable predictions about a similar subject-matter. I suggest that it is possible to make especially strong and (potentially) easily falsifiable predictions on the basis of the present theory because the theoretical, especially the semantic notions employed in it are – that is what I attempted – thoroughly derived from perception, action, and symbol use. They are not modeled on linguistic^{o} evidence but deduced independently of it. The advantage that the present theory may have over other theories of the linking competence may lie in the fact that statements and predictions involving theoretical, especially semantic notions can – for the sake of falsification – be "traced back" even to basic mechanisms of perception, conceptualization, action/attribution, and symbol use. In brief, they can be falsified even by data outside linguistics, but for the sake of linguistics. Note that the same does not hold true for the research programme in which the theory is embedded, since this is by definition not a hypothesis or a theory, but a normative – though generally acceptable in its metaphysical assumptions – background in front of which theories become possible.

[197] Thanks to Hanni Schnell for the idea that it is the most prominent feature that is crucial here.

Please note that there is also a reconstruction of traditional semantic notions in Appendix A which can very well be considered "consequences" of the present research programme and theory. Further possibilities for reconstructing such notions can be found in the text (e.g., section 3.4.8 on the temporal structure of circumstances). In what follows 1.–18. give some predictions, 19.–24. some consequences I deem especially worth mentioning.

1. Typology: Languages with basic syntactic constructions in which expressions coding trajectors precede expressions coding landmarks should be preferred from the perspective of "ease of conceptualization" and the utterance-as-instruction-for-conceptualization perspective (see sections 3.3.1 and 3.3.2). Cross-linguistically, this phrase order tends to be associated with S>O structures (i.e., SVO, SOV, VSO).
   Furthermore, the number of conceptual functions (trajector and landmark) in non-complex circumstances corresponds to the number of syntactic functions (S and O) in simple transitive sentences. Typologically, languages differ as to the basic order between S and O, where S>O is by far the predominant order. This can be explained by recourse to diagrammatic iconicity and the regular mapping between conceptualizations and constructions (see section 3.3.2), and it is directly applicable to Greenbergs (1963: 77) early observation, according to which "[i]n declarative sentences with nominal subject and object, the dominant order is almost always one in which the subject precedes the object." (More recent data from a more comprehensive set of languages show that of 1377 languages surveyed in the World Atlas of Language Structures, 1148 have a basic order in which S precedes O; cf. Dryer 2011).

2. Typology: When there is a third syntactic function besides that expressing a trajector and that expressing a landmark, it is predicted that the referent of that function is either part of a complex circumstance (with at least two sub-parts), such that the third function refers to an object that is the landmark in one but the trajector in another sub-part of that circumstance (see, for instance, Figure 3.26 and comments there). An example for such an object is what *yi-hu jiu* 'a jug of wine' in (4.110) refers to (Chinese; example taken from Huang, Li & Li 2009: 82). In the conceptualization underlying that sentence the jug of wine is initially the landmark of the action of the referent of *ta* and then functions as the trajector that moves toward the landmark expressed by *gege* in another sub-part of the circumstance.

   (4.110) *ta di-gei gege yi-hu jiu.*
   he pass-give brother one-CL wine
   'He passed his brother a jug of wine.'

   Or the referent of the third syntactic function exhibits internal actional involvement along the lines outlined exemplarily in section 4.1.6.2. Or both conditions apply. The former case is exemplified by *henna* 'her' in (4.111) (Icelandic; example taken from Thráinsson 2007: 218) and *anyaní* 'baboons' (4.112) (Chichewa; example taken from Mchombo 2004: 80). In (4.111) the referent of *henna* need not be present while the

referents of *Þeir* are finding her a new job. It is very likely, however, that this concerns her goals and interests, constituting internal actional involvement on her side. The same can be said about the baboons in (4.112).

(4.111) *Þeir fundu henna nýtt starf.*
they.NOM found her.DAT new.ACC job.ACC
'They found her a new job.'

(4.112) *Alenje a-ku-phík-íl-á anyaní zítúmbûwa.*
2-hunters 2SM-pres-cook-appl-fv 2-babboons 8-pancakes
'The hunters are cooking (for) the baboons some pancakes.'

3. Typology/language comprehension: When there is a complex circumstance (with at least two sub-parts) where a particular conceptual object functions as the landmark in one and as the trajector in another sub-part (such as the transferred object in transfer events), languages that exhibit alternative verbalizations for such events allow two orders between the expression of the transferred object and the expression of the recipient (see examples (4.16) and (4.18) in section 4.1.6.2 for German). This is also exemplified in (4.113) and (4.114) (Mandarin Chinese; examples taken from Huang & Ahrens 1999: 2).

(4.113) *Wo song ta yi ben shu.*
I gave s/he one CL book
'I gave him/her a book.'

(4.114) *Wo song yi ben shu gei ta.*
I gave one CL book GEI s/he
'I gave a book to him/her.'

Irrespective of whether the referent of *ta* 's/he' in (4.113) exhibits internal actional involvement, it is predicted that (4.114) is preferred in language comprehension as regards "ease of conceptualization": The utterance can be used as a diagrammatically iconic instruction for simulating the perceptual experience of that giving event. This is not possible for (4.113) to the same degree. The additional cognitive effort associated with the comprehension of (4.113) and its analogues in other languages should be measurable in terms of reaction times, accuracy, neuronal activity etc. in relation to (4.114) such that higher cognitive effort should be measurable in terms of higher reaction times and lower accuracies in psycholinguistic experiments or in terms of increased neuronal activity in the context of neurolinguistic experiments, e.g., electroencephalography (EEG).

4. Typology/language comprehension: In languages with a basic O>S phrase order (i.e., OVS, OSV, VOS), it is predicted that "anti-iconic" mappings are preferred as regards "ease of conceptualization". Anti-iconic are those mappings that inverse the regular

mapping in languages with a basic S>O order (see sections 3.3.1 and 3.3.2). That means when there is a complex circumstance (with three conceptual objects and at least two sub-parts) where one of the conceptual objects functions as the landmark in one and as the trajector in another sub-part (such as the transferred object in transfer events), the order recipient expression > transferred object expression > agent expression should be associated with less cognitive effort in language comprehension than an alternative order conforming to a basic O>S order, i.e., transferred object expression > recipient expression > agent expression. Higher cognitive effort should again be measurable in terms of higher reaction times and lower accuracies in psycholinguistic experiments or in terms of increased neuronal activity in the context of neurolinguistic experiments, e.g., electroencephalography (EEG). An example for an anti-iconic mapping is given in (4.115) for Tiriyó, an O>S language (example and classification adopted from Meira 1999: 514, 582).

(4.115) *ji-pawana-rï_ja pakoro w-ekarama-e*
1-friend-Pos_Dat house 1A-give.Prs.Ipf-Cty
'I am giving a house to my friend.'

5. Typology: Since it takes motivation to be primary to exploitation, the present proposal predicts/explains that if a language hypostatizes states, relations, quantifications etc. by using nominal expressions for them, it also has nominal expressions for "true" objects in sensation/conceptualization.

6. Typology: Because restrictions on passivization are closely related to the conditions governing split intransitivity, namely attribution of responsibility, one would expect cross-linguistic^{o} differences in both phenomena due to different praxes of attribution. If attribution of responsibility is the critical factor, variation is expected regarding the question of where the split between unaccusatives and unergatives on the one hand and between passivizability and non-passivizability on the other hand semantically takes place.

7. Language comprehension: Exploiting instances of utterances are either instances of compressing multiple conceptualizations into a single utterance (*All men fall off their bikes in Marburg*) or of hypostatization (*Unemployment is threatening the Spanish youth*) (see Figure 3.40 in section 3.3.7). Understanding exploiting utterances requires greater cognitive effort than understanding motivated utterances (*Peter is kissing the blond woman*) because they require "decompressing" an utterance conceptually: Where a motivated utterance is an instruction for simulating some unique conceptualization, an exploiting utterance forces an actor/cognizer to make numerous conceptualizations in order to approximately understand that utterance. For instance, understanding utterances coding high level temporal structures (e.g., at the attribution level: *Russia privatizes the Soviet industry*) not only superficially requires decompressing that utterance into numerous more fine-grained

conceptualizations. This should be measurable in terms of reaction times, accuracy, neuronal activity etc. (see predictions 3 and 4).

8. Language comprehension: Regular mapping means expressing the trajector expression before the landmark expression since this reflects how a circumstance unfolds. (This cannot be equated with an S<O order but tends to be one, cross-linguistically.) Any order deviating from this order requires a re-analysis that is iconic with respect to the circumstance itself, so that the interpreter is able to simulate the corresponding perception. This should be measurable in terms of reaction times, accuracy, neuronal activity etc.

9. Language comprehension: Consider a locally ambiguous utterance in incremental interpretation where the last element in the utterance disambiguates it for the interpreter with respect to the order of trajector and landmark expressions, e.g., *…dass die Lampe die Männer trifft*/*treffen* 'that the lamp hits the men'/that the men hit the lamp'. In this (partial) utterance the last element, the verb, determines who does what to whom and with it the trajector/landmark structure. If it turns out for the interpreter when integrating the verb into his/her interpretation that the overall structure exhibits a landmark>trajector order (corresponding to the 'men hit lamp' interpretation when encountering *treffen*), the interpretation of that utterance should cause more cognitive effort (to be measured in terms of reaction times, accuracy, neuronal activity etc.; see predictions 3 and 4) than when it turns out to exhibit a trajector>landmark order (corresponding to the 'lamp hits men' interpretation when encountering *trifft*). This is because the utterance with the landmark>trajector order needs re-analysis by the interpreter for him/her to be able to simulate the corresponding experience.[198]

   a) This should hold true language-internally, e.g., between active sentences and their passives.
   b) This should hold true cross-linguistically, i.e., where a language regularly maps landmarks to first positions.

10. Language comprehension: The approximate understanding of an utterance is a variable concept in that it is a matter of degree.[199] Although this might be a trivial point, it is non-trivial that the present proposal offers a possibility to quantify understanding to some extent. Locating the interpretation of an utterance on different levels of organization (sensation, identification, attribution; see sections 3.4.3 to 3.4.5) allows a classification of the degree to which someone understands an

[198] With regard to the example chosen here one should be aware of the fact that the disambiguation towards the 'lamp hits men' interpretation may also be associated with some additional cognitive effort because it violates the RCP: The men are more probably the (responsible) causer in that event.

[199] Note that this usage of „understanding" concerns the question of what conceptualizations and/or attributions an interpreter is able to associate with a given utterance. It is not to be mistaken for the question of what the conceptualization and/or attribution of the producer of that utterance could look like and whether it is similar to that of the interpreter. The latter concerns mutual understanding and is dealt with in the introduction to chapter 4.

utterance in the following sense: Is the interpreter of some utterance able to understand it on the attribution level? If yes, is he/she also able to understand it on the identification level? If yes, is he/she able to trace it back even to particular figure/ground configurations in sensation? Applying this rationale to an example like *Russia privatizes the Soviet industry* yields something like this: Understanding this on the attribution level means knowing that some person(s) in the Russian government can be made responsible to have employed certain measures in order to put the purpose into effect that the Soviet industry is no longer in the hands of the government but at the disposal of private persons. Understanding the utterance even "better" would mean to be able to give the certain or probable ancillary action schemas by means of which this purpose is put into effect. At the level of identification one could even be able to name the necessary circumstance schemas that are associated with that far-reaching event. And a rather complete (but improbable) understanding would be given, if someone could break down this event into the figure-ground configurations that actually constitute schemas on the identification and attribution levels. What is crucial, however, is that "deeper" understanding (in the sense of "going down" the levels) is associated with more cognitive effort, and that the term "understanding" can be operationalized in this way.

11. Language comprehension: The (responsible) causer preference (RCP; see section 4.2) and its underlying mechanisms (concerning affordances, causation, the difference between reasons and causes; see sections 3.2.1 and 3.2.2) predict that (4.116) and (4.117) below will differ as to the cognitive effort that is required in language comprehension. (Examples are taken from Röhm et al. 2004; see also Schlesewsky & Bornkessel 2004: 1223.)

(4.116) ... *welchen Mönch der Zweig streifte.*
which.ACC monk the.NOM twig brush.PAST
'… which twig brushed the monk.'

(4.117) ... *welchen Mönch der Bischof begleitete.*
which.ACC monk the.NOM bishop accompany.PAST
'… which bishop accompanied the monk.'

Case-marking in both sentences indicates that the first NP encountered in incremental interpretation is the grammatical object and the second one the PSC. In (4.116) the second NP encountered is inanimate and thus does not afford self-induced movement but may only move if it is causally affected itself. The second NP in (4.117) is human. It therefore affords self-induced movement and may be attributed responsibility. However, according to the RCP and the large-scale law of closure human actors/cognizers strive to identify the responsible causer, i.e., the uncaused causer, of any event. The need for closure of the event at the "front end" cannot be satisfied by (4.116): The motion of the twig must be externally caused by

an unknown causer. It is satisfied in (4.117). For the actor/cognizer, the bishop certainly closes the event at the front end. Thus, the attempt to close the event coded by (4.116) at the front end causes the additional neuronal activity detected by Schlesewsky and Bornkessel (2004). Because of the presumably universal character of the RCP, similar results are predicted for analogue examples in other languages.

12. Identification/categorization and conceptualization: The speakers of different languages should be equally competent in the differentiations they are able to sense, identify/categorize, and conceptualize. But they have conventionalized different means of coding differentiations in terms of grammatical and lexical material. This in turn may lead to different identification/conceptualization routines when feeding back to language use. However, people's routininized action schemas are not identical with the action schemas they are in principle able to actualize. Given the respective purposes, non-routinized differentiations can be made. (I have argued for this and against Whorfian accounts in section 3.3.4.) Other sources of differential identification/conceptualization routines that are not linguistically^{o} induced are different pertinence patterns of perceptual units in practical contexts.

13. Attribution: Members of different speech communities/cultures may make use of different parameters in attribution, in particular regarding the determining factors. This may lead to different attributions and attribution habits. Since the notion of agentivity is derived from the attribution of responsibility, there is cross-cultural variation expected regarding what agentivity is.

14. (Responsible) causer preference: There is no cross-cultural variation in the RCP, since it is "naturally" grounded by means of the large-scale law of closure. (One could even go further and argue that this is an adaptational advantage, since being able to identify responsible causers in one's environment makes events in one's environment more predictable, thus avoiding potential threat.) This does not contradict prediction 13, because it leaves open only the precise criteria by which some attributional praxis declares a causer responsible, while it leaves unquestioned that responsibility is actually attributed.

15. Language acquisition: As a prediction, it would be rather surprising if children up to school age (and often beyond) frequently produced hypostatizations, i.e., instances of exploited language use. They can presumably hardly understand utterances like *Unemployment is threatening Spanish youth*, i.e., they might not even know what to conceptualize at all. Apart from mastering morphological operations like derivation, children must have available a rich common ground with their interlocutors and encyclopedic knowledge which are required for an approximate understanding of hypostatized utterances (see section 3.3.7).

16. Genesis of grammar: The invention of verbs can be argued to have been a crucial step in the early development of language. The ideas on semantics proposed in this

book assert that verbs are hypostatizations in that they refer to nothing except the object(s) "at" which a circumstance manifests itself (see section 3.5). Evolutionary, figure-apt entities (moving, small relative to background) are easily referred to in pointing to them and uttering a (then) object expression. In contrast, circumstances are a different kind of ontological category in that they are embodied by objects but are "nothing" for themselves. But a "language" without circumstance expressions, exhibiting only object expressions is too underspecified to serve communicative purposes. Therefore, "sourcing out" the circumstance aspect from (the) object(s) by externalizing these aspects as a special category in the symbol system (i.e., the verb) is a major step towards a symbolic communication system in general and syntax in particular.

17. Genesis of grammar: Introducing elements into the symbol system that are externalizations of aspects of objects (features and circumstances are aspects of objects; adjectives and verbs are externalizations of such aspects; see section 3.5) means introducing different categories into the symbol system: The ontological relationship between objects and their aspects is an asymmetrical one. This in turn means introducing a crucial mechanism into the symbol system: dependency. From this perspective, dependency can be argued to be one of the beginnings of a grammar.

18. Grammaticalization: Cross-linguistically, passive auxiliaries are mostly former lexical verbs. It is cross-linguistically common that the verbs that grammaticalize towards passive auxiliaries are verbs of having and getting (cf. Heine & Kuteva 2007: 80). Why should this be the case? Most lexical verbs that are passivizable map trajectors to PSCs, therefore most grammatical objects in active sentences of this sort are landmarks. That means some fictive or concrete motion/movement is directed from the trajector to the landmark. What passives do is make active objects passive PSCs without altering the conceptualization of the circumstance. A language developing a passive should choose itself a passive auxiliary from those lexical verbs which map landmarks to PSCs. Therefore, the present theory predicts that new passive auxiliaries should develop from former lexical verbs that map landmarks to PSCs.
    This is well documented for German regional varieties (as exemplified in (4.118); cf. Lenz (2012)). It is also documented for Seychellois, a French-based creole (as exemplified in (4.119); example taken from Corne 1977: 161, cited in Heine & Kuteva 2007: 81). In this case, the auxiliary *gaŷ* 'get' developed out of French *gagner* 'gain', a verb that maps its landmark to the PSC.

    (4.118) *Julia kriegt/bekommt/erhält das Auto gewaschen.*
    Julia.NOM get.AUX the.ACC car wash.PTCP
    'Julia is getting the car washed.'

    (4.119) *zot pa ti gaŷ êvite dâ sa festê.*

They NEG PAST get.AUX invited in that party
'They did not get invited to that party.'

As mentioned at the beginning of this section, the following points constitute consequences rather than predictions.

19. Theory of meaning: In the history of linguistics and philosophy of language there are two theories of meaning that seem to exclude each other. In fact, linking theories neglect one of them systematically, namely the "meaning as use" perspective, and they do so in favour of the "meaning is reference/designation" perspective (cf. Lyons 1991). What I attempt is to reconcile both: The "meaning is reference/designation" view is represented by diagrammatically iconic mappings where the utterance has something in common with the circumstance it codes and is acquired in contexts of joint attention and triangulation. The "meaning as use" view is represented by the arbitrary pairing of conceptual contents with utterances in dependence of interactional variables and common ground, without triangulation. Both views are condensed in the two acquisition modes in section 3.3.7. This also represents an attempt to reconcile the young "Tractatus" Wittgenstein with the old "Philosophical investigations" Wittgenstein.

20. Autonomy of syntax: If utterances can be systematically iconic with respect to conceptualizations, then syntactic structures can be motivated. Arbitrariness and motivation of syntax are two poles on a scale. Highest motivation is given where an utterance is an instruction for simulating a perceptual experience. Highest arbitrariness is given where no coherent conceptualization can be build up from an utterance, i.e., where communication does not succeed (see section 3.3.8). Chomskyan Linguistics makes the latter case its paradigmatic observation. The present research programme makes the former case its paradigmatic observation. While it is difficult if not impossible for CL to accommodate motivation in syntax (employed strategies are declaring it epiphenomal or part of use or the broad faculty of language (FLB)), the present programme and Instruction Grammar can accommodate arbitrariness, if necessary.

21. Case theory: The special behavior of German "free" datives (or other cases in other languages) can be predicted on the basis of the considerations in section 4.1.6.2: It is possible that the referents of these expressions do not immediately stand in a relation to (an)other object(s) in a circumstance but in a relation to a relation between other objects or the circumstance of another object. More specifically, it is possible that it exhibits internal actional involvement.

22. Case theory: The considerations in section 4.1.6.2 on the German dative may serve as an explanation for instances of well-formed and acceptable double datives (or other cases in other languages. This may be possible where one dative referent

exhibits asymmetric bi-directionality and the other exhibits internal actional involvement, as exemplified in (4.120) and (4.121).

(4.120) ?*Er hat mir dem Kind zu viel Süßes gegeben.*
he.NOM has.AUX me.DAT the.DAT child too much candy.PL give.PTCP
'In my opinion, he gave the child too much candy.'/lit. 'To me, he gave…'

(4.121) ?*Dass du mir dem Kind nicht zu viel Süßes*
that you.2NOM me.1DAT the.DAT child NEG too much candy.3ACC
gibst!
give.2
'Don't even think about giving the child too much candy!'

23. Case theory: The considerations about the function of constructions and cases in general (see sections 4.1.1 and 4.1.6, respectively) offer a possibility to make the structurality vs. lexicality of cases a matter of degree. It depends on the role of a case category in a particular construction. Because the differentiations a case category accomplishes depend on the construction in which it occurs, the conceptual "load" of a case category may differ. This has been demonstrated using the example of an NP_{nom}-V construction and an NP_{nom}-V-NP_{dat}-NP_{acc} construction. The range of conceptual differentiations of the nominative is considerably smaller for the ditransitive construction than it is for the intransitive construction. In other words, the nominative is more structural in the latter and more lexical in the former.

24. Agentivity: The underspecification of percepts and concepts, their specification by means of actional knowledge and attribution, and the (responsible) causer preference (RCP) constitute a psychologically and actionally plausible basis for the well-known effector-to-agent pragmatic implicature, according to which human/animate causers are interpreted as "intentional agents" (cf. Holisky 1987, van Valin & Wilkins 1996).

4.6 Summary of part III

Part III has turned away from the species/community level in the model underlying the research programme, i.e., away from the sub-competences to the individual level and the linking competence in the strict sense. The results from the sections on perception, conceptualization, action (attribution) are brought together here in order to outline how German verb-complement structures are organized, how they are motivated by the workings of the sub-competences, and why verb-complement structures behave as they behave under certain circumstances.

First, the notion of "meaning" has briefly been reconstructed as that which sustains the illusion of understanding between two actors/cognizers in the face of necessarily dissimilar concepts of even a single circumstance. Bearing this in mind, the contribution of formal constituents of syntax to the well-formed and appropriate coding of semantic contents

(conceptualization +/- attribution) has been explicated (4.1). The constituents discussed were the "bare" construction, noun, verb, as well as phrase order, agreement and case morphology. It could be shown that especially the number (adicity) and nature (trajector, object landmark, location landmark) as well as the affordances of the objects involved, the conceptual components conflated in verb morphology, and the distribution of trajector and landmark to the complements of the verb are important for making an utterance an instruction for simulating the perception of a circumstance in a way that does not let the verbal interaction between a speaker and an interpreter fail. Complementing the discussion of the contribution of case morphology, a theory of the German dative has also been developed.
Because the formal properties of utterances often do not suffice to assure the illusion of understanding and thus do not make successful linking possible, the contribution of non-formal properties to linking had to be discussed, too (4.2). In accordance with the primacy of objects over circumstances in conceptualization, the non-formal properties concern objects, in particular the notions of animacy, individuation, person, and empathy, each of which exhibits a scalar organization. The well-known "subject preference" in (incremental) interpretation could then be reconstructed as a (responsible) causer preference (RCP), stating that high prominence of an NP referent on the abovementioned scales increases its capability of closing a circumstance at the front end, thus satisfying the large-scale law of closure.
The next step was to list examples of motivated conceptualization-syntactic structure mappings, using the most important constructions in German (4.3). How such mappings are actually enacted in the context of verbal interactions was then demonstrated by means of two exemplary scenarios: a comprehension scenario and a production scenario. They illustrate how the sub-competences and the formal and non-formal information are utilized by actors/cognizers to obey a linguistic^{o} instruction in order to simulate a perception and to build up such an instruction, respectively.
The next section (4.4) is concerned with classical problems of the syntax-semantics linking. In order to solve these problems, i.e., to explain why these linguistic^{o} phenomena show the behavior they show, all notions developed throughout parts II and III had to be employed together. How the landmark in circumstances is conceptualized in detail has turned out to be of special importance in linking conceptualizations and syntactic constructions.
The final section of part III, section 4.5, presents a selection of predictions and consequences that can be drawn from the theory of the linking competence. They concern, among others, typology, language comprehension, language acquisition, case theory, and the genesis of grammar.

5 Conclusion

Throughout this work, a research programme has been developed that is supposed to satisfy one crucial condition: The human linking competence should be grounded in both nature and culture, i.e., in cognitive competences that develop independently of cultural influences and in competences that do not develop independently of the participation in a sociocultural praxis. The linking competence has been characterized as the competence to code conceptual and actional matters by means of utterances containing verb-complement structures

(constructions) in a well-formed and situationally appropriate manner. The naturally and culturally grounded sub-competences were identified as perception, conceptualization, action (attribution), and relating conceptual structures to arrangements of linguistic^{o} symbols. Uncovering the systematic relationship between syntax – in terms of constructions – and semantics – in terms of circumstance concepts as trajector-landmark configurations +/- attributions – made a multidisciplinary account necessary. Traditional semantic descriptions using predicate-argument structures have been disregarded in favor of a conceptual structure based on evidence from cognitive psychology and cognitive neurosciences. This conceptual structure had to be complemented by actional, i.e., attributional information because otherwise it is underspecified with respect to these matters. Only in combination conceptualization and attribution may account for the abilities of a language user.

A semantic theory grounded in perception and action has some properties that distinguish it from traditional semantic theories. First, a correspondence theory of truth is not available. If utterances code conceptualizations and attributions, a completely different problem than truth arises, namely that of the validity of one's claims. On what basis may one claim validity for his/her statements if they have great social significance, i.e., if they are judgments as to the responsibility, guilt, praise or reprimand of oneself or others? Not only a notion of truth is negligible in this context but many notions supposed to be indispensible for a linking theory become questionable, among them thematic roles like that of "agent". If objective criteria for assigning thematic roles to objects fall away, one needs other criteria to take their place. I have attempted to provide these criteria by outlining the perceptual and conceptual mechanisms that actors/cognizers share. On their basis they come to have similar though not identical concepts of circumstances which they can make intersubjectively accessible by talking about them (the indefinite semiosis notwithstanding) or by enacting what they claim, following the motto that truth is success in action (cf. Janich 2006: 186–209). What is more, socially significant matters with respect to which percepts and concepts are largely underspecified are negotiated by the utilization of an attribution theory that is internalized by the native speakers of a language, or alternatively, by the participants in a sociocultural praxis. As such they are imposed on percepts and concepts.

With respect to the grammatical part of the linking competence – syntactic structures and operations – it is inherent in the symbol system that basic constructions underlying utterances can be described independently from conceptual considerations, but I have attempted to show that this necessarily results in a huge loss of generalizability and explanatory power. The notion of diagrammatic iconicity cannot be reconciled with a completely autonomous syntax. The consequence would be that one has to neglect the regular correspondences between circumstance types in terms of trajector-landmark configurations and constructions including case assignment and the determination of PSCs. Furthermore, the conditions on syntactic operations and alternations as discussed in the latest sections demonstrate that not looking at conceptualization and attribution also leads to a huge loss of explanatory power. One cannot explain the conditions on passivizability, imperativization, the dative alternation, and so on without taking attribution of responsibility into account. One cannot explain most of the other so-called "argument alternations" when ignoring the conceptual constitution of the landmarks involved in the underlying circumstances. Neglecting the close correspondence between sociocultural praxes and perception on the one hand and linguistic^{o} structures and conditions

on syntactic operations on the other means giving up the most basic insights about the linking competence.

In the first part of this book I promised to develop a theory of the linking competence in accordance to the research programme proposed in the corresponding sections (see Figure 2.3). The model underlying that research programme and the filling of its "panels" has been discussed in a rather general manner. I have stated that on the data level there are syntactic structures and interactional variables that describe verbal interaction. On the individual level the theory of the syntax-semantics relationship is meant to describe the linking competence, and on the species/community level theories of non-linguistic° competences and interaction are supposed to describe the respective competences and interaction. Parts II and III should serve to breathe life into these general notions. Accordingly, the model underlying the research programme proposed here can finally be filled in by the key theoretical notions and mechanisms whose explication was the main purpose of this work.

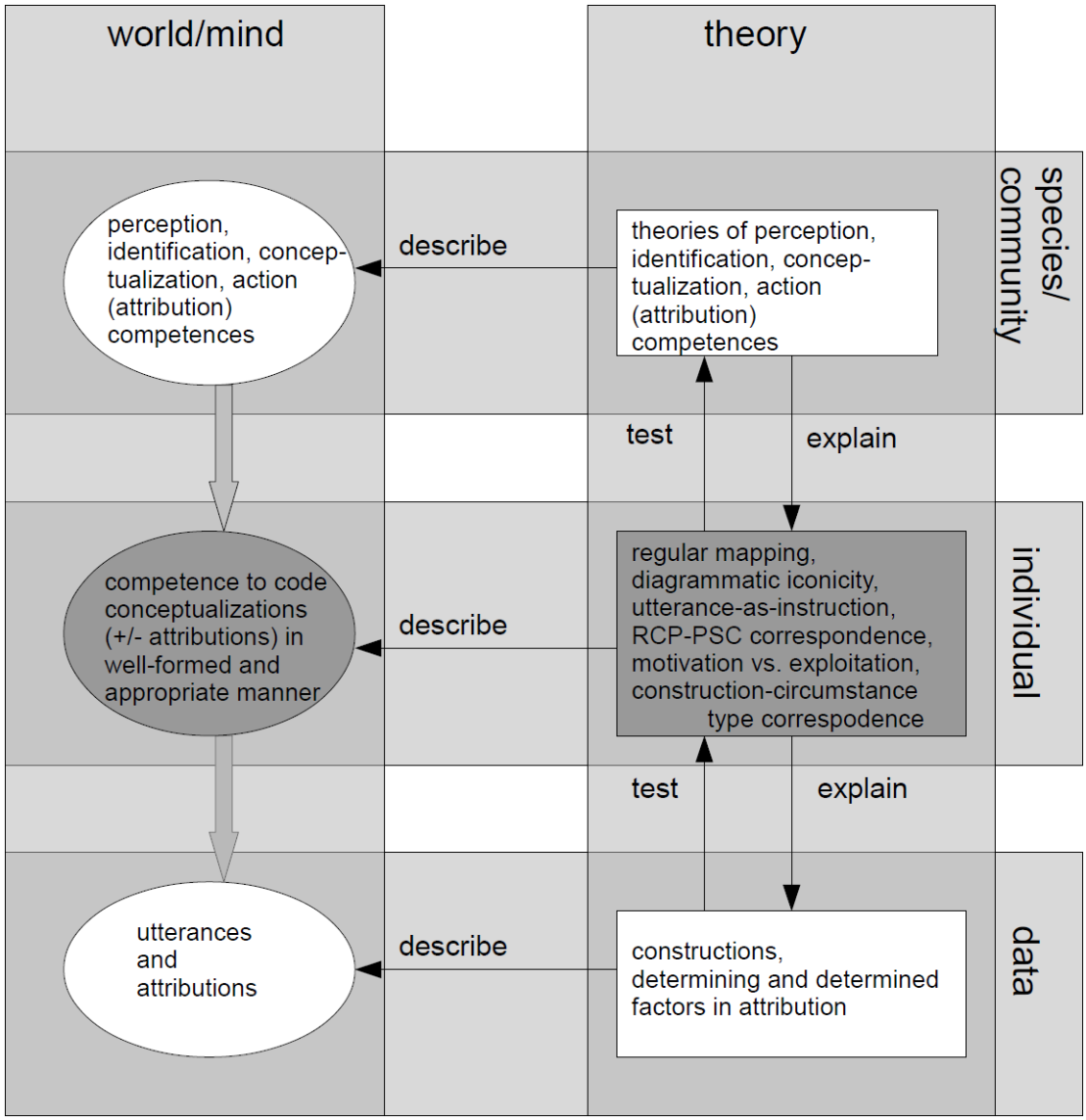

Figure 5.1: Model underlying the research programme, specified for linking competence as developed throughout this work

Some more general conclusions may be appropriate here. In part I I justified the deviation from the Cognitive-Functional Linguistics framework by stating that CFL sticks to individual cognition when dealing with the linguistic^{o} competence. I dedicated large parts of the present work to the demonstration that the linking competence cannot be characterized adequately without taking into account the embedment of linguistic^{o} activities in sociocultural praxes. It is mechanisms of our living together – supra-individual matters – that shape how we use and understand language in crucial respects. In fact, meaning has been argued to be a social activity, not an individual one. It is what does not let fail verbal interaction; meaning shows itself in success in (inter)action. This is the crucial difference between conceptualization and meaning. CFL claims that meanings are embodied because meaning is conceptualization. I have tried to show that conceptualization is in important respects and to a large degree embodied in the senses in which people in the neurocognitive community understand it: Its workings can be described as the result of evolutionary processes, of the interplay between the physis of a living being with the environment in which it lives, as being subjected to natural laws, as being constrained in its potentialities by the anatomical and physical limits of the body and so on. But all this does not hold for understanding and with respect to the notion of meaning. Where we subject these activities to natural laws and to embodiment, we surrender our most highly developed praxes to relativism and contingency, among them our scientific claims. Understanding and establishing meaning in interaction are cultural activities. Where they are reduced to natural objects they cease to exist.

Glossary

action type of →movement that can be desisted from in accordance with →attribution, and that cannot be described (predicted) scientifically by means of natural laws. Attributing a. corresponds to attributing someone →responsibility for some activity (→circumstance). To be differentiated from →behavior.

actor/cognizer human being involved in internal (cognitive) and/or external (physical) activities (→movement), either →perceptual, →conceptual (→identification), actional (→attribution), (and/) or verbal. The a./c. can be shown to be a pragmatic who always strives for maintaining his/her self-concept and for realizing his/her →purposes. Practical consequences are that his/her attributions do not conform to lay scientific methods but are pragmatic in kind.

adicity aspect of →circumstances and →constructions that concerns the number of objects/NPs that are (co-)determinative of the identity of the circumstance and the construction, respectively. Subtypes dealt with are monadic, dyadic, and triadic circumstances and constructions.

affordance a state/process/activity (→circumstance) that an →object indicates to a perceiver/conceptualizer neuronally and conceptually on the basis of its recognized (bottom-up a.; →perception) or →identified →features, the frequency with which it occurs in certain circumstances, and the present →purposes (→pertinence) of the perceiver/conceptualizer.

attribution cognitive activity (→circumstance) of →actors/cognizers concerning the ascription of →action and →behavior (→responsibility) to the animate →objects involved in activities with respect to these activities. A. is part of sociocultural →praxis. Actor/cognizers' attribution performances can be shown to depend on certain socio-cognitive parameters that cannot be reconciled with the view of the actor/cognizer as a lay scientist. A. applies to, or operates on, percepts (→perception) or concepts of (→conceptualization) →circumstances that are inherently →underspecified with respect to the factors governing a.

behavior type of →movement that cannot be desisted from in accordance with →attribution and that can be described scientifically by natural laws. Attributing b. corresponds to exonerating someone from →responsibility for some activity (→circumstance). To be differentiated from →action.

capacity the (condition of the) possibility to develop a →competence. While human beings are capable of developing the →linking competence, other species are not. Being capable of something is a necessary though not sufficient condition for the development of a competence.

categorization → identification

causation aspect of the relation between two →circumstances with respect to which →percepts are →underspecified. An instance of c. is →identified where the →objects involved in two circumstances exhibit mutually dependent →affordances, where the circumstances are identified to stand in a relation of spatial and temporal contiguity, and where exertion of force is either haptically sensed or →neuronally re-enacted, having the status of a simulated perception (→conceptualization).

circumstance form of appearance of an →object. C.s of objects or between objects are in a →perceptual and →conceptual sense inherent to the objects, namely as actualizations of →affordances which in turn depend on the →features of the object(s). C.s express themselves only "through" objects and are in this sense secondary to objects: It is impossible to conceptualize some polyadic (→adicity) and/or complex (→complexity (temporal)) c. without conceptualizing some object(s) first by which the c. is constituted.

closure in the domain of →perception supposedly one of the →gestalt laws that contribute to integrating →features into →objects. The law of c. states that elements are more likely to belong together which yield a closed shape when "filled in". In →conceptualizing (+/-attribution) →circumstances c. represents the need of an →actor/cognizer for identifying (either by →identification or by →attribution) the (responsible) cause(r) (→responsible causer preference (RCP)) of that circumstance in order to be able to evaluate the consequences of that circumstance for him-/herself and his/her action plans (→purpose). The latter can be considered a "large-scale" law of c.

competence ability to actualize particular →movement →schemas.

complexity (temporal) concerns the number of sub-parts of a →circumstance. Circumstances can be segmented at the levels of sensation (→perception) in terms of →figure/ground configurations, →conceptualization in terms of →schematizations, and action (→purpose), yielding different segmentations. Segmentations on higher levels respect segmentations

on lower levels.

concept simulated percept (→perception) or activity (→circumstance, →movement) retrievable from memory, including →object →affordances. On the neural level a partial →re-enaction of the neuronal activity which is also observable in the actual perception of something or the enaction of some movement →schema.

conceptualization activity of simulated →perception (→concept). Contents of conceptualization are restricted to what is in principle perceivable. Matters like →purposes, dispositions, causes (→causation), or affections are not conceptual in kind but belong to the domain of →attribution. C. provides the structures to which utterances (→construction) are →diagrammatically iconic. Central to these structures are the notions of →trajector and landmark.

construction syntactic structure underlying utterances in terms of →adicity, parts of speech, morphological case, and morphological agreement. C.s are supposed to regularly code →circumstance types in terms of →trajector & landmark configurations by means of →diagrammatic iconicity. C.s exhibit different degrees of polysemy and homonymy in dependence of their formal properties. C.s also vary with respect to whether they are →motivated or exploiting instances, whether they code allocentric or egocentric reference frames, and they vary with respect to →complexity, and with respect to whether they exhibit regular or inversed →mappings.

culture complex of →actions, interdependent actions, concerted actions, their →schematizations, and →attributional norms within a community.

diagrammatic iconicity perceivable similarity between the organizational principle underlying a symbol system like language and something outside the system. Here, the organization of utterances in terms of →constructions are conceived of as d. i. to the order in which →conceptualizations unfold or as d. i. to the order in which an actor/cognizer's eye gaze is simulated.

differentiation d.s are what categories are constituted by (→identification). Categories are not the result of the partitioning of the environment in accordance to objective criteria but are brought about by how living beings act (→action) or behave (→behavior) towards →objects in the environment, depending on their biotic make-ups (→embodiment) and present →purposes. In general, indifferent activities towards various objects in similar contexts by different human beings make these

objects belong to a category.

embodiment cover term for the diverse ways in which neuronal, cognitive, and bodily activities (→movement), accomplishments, potentials as well as their epistemological validity can be shown to be dependent on the biotic/physical makeup of their bearers.

exploitation kind of relation that a linguistic^{o} form bears to some →conceptualization. E. is opposed to →motivation (see also →diagrammatic iconicity). In the case of e., a linguistic^{o} form exploits the organizational principle of motivated conceptualization-linguistic^{o} structure →mappings, either by pretending to code a unique →conceptualization (→trajector & landmark) while it actually compresses multiple conceptualizations into a single construction, or by →hypostatization, i.e., by pretending to code an →object while it actually codes a →circumstance.

feature perceptual f.s are what is integrated by means of →gestalt laws into →objects. What can be a feature is restricted by what a living being can →differentiate in its environment in terms of the feature detectors in its perceptual apparatus (→embodiment). F.s play a crucial role in what →objects →afford to →actors/cognizers, since the →identified f.s of an object restrict the range of →circumstances in which this object can stand.

fictivity (motion/ movement) there may be →motion/→movement →conceptually while there is actually none in the environment. This "fictive" motion/movement thus relates to the simulated eye gaze that conceptualizers employ when they "scan" a concept, for instance by gradually moving their (simulated) visual focus from one object of conceptualization to another object of conceptualization in a stative relation.

figure & ground the notions giving structure to →percepts. By integrating formerly disintegrated →features into wholes by means of the →gestalt laws, the resulting →object is segregated, or isolated, from a background. Across all instances of singling out objects from backgrounds, the isolated object is called f., and the background from which it is singled out is called g. The g. may eventually exhibit →object →features similarly to the f. Then it is the g. relative to which the f. is singled out, i.e., in relation to which the →circumstance of the f. is specified. A g. that has no object features is called "location g.", a g. with object features is called "object g."

gestalt laws notion from perceptual psychology with somewhat unclear status but

undeniable significance. G. l.s are instrumental in grouping stimuli of →perception into (parts and) wholes, i.e., in making possible recognition of discriminable →objects by integrating formerly disintegrated →features (→figure & ground). There are five g. l.s: proximity, similarity, common fate, →closure, and good continuation.

goal (action theory) → purpose

ground (perception) → figure & ground

grounding problem originally the question of how meaningless symbols in a computational mind can "have →meanings" although they are not connected to the environment they are supposed to be "about". Here, the problem of how the →linking competence can be traced back to sub-competences that relate to →perception, →conceptualization, and action (→attribution).

iconicity → diagrammatic iconicity

identification cognitive activity (→movement) of matching a percept (→perception) with a retrievable →concept on the basis of the →salience (as stimulus-driven i.) or →pertinence (as purpose-driven i.) of the stimulus.

incremental interpretation a feature of on-line interpretation, according to which interpreters immediately integrate each "incoming" part of an utterance into their →conceptualization of that utterance. At any point they strive for maximizing their prediction of how the uttered sentence and thus the coded →circumstance →concept will work out.

interest → purpose

hypostatization kind of →exploitation besides compression. H. is given where a linguistic^{o} form, mostly a noun, pretends by its category to designate a conceptual →object, while it actually codes a whole →circumstance →conceptually. It is thus a linguistic^{o} strategy to exploit →diagrammatic iconicity (→motivation).

landmark → trajector & landmark

linking competence the ability to encode and decode →concepts of →circumstances successfully, i.e., either by being able to produce appropriate and well-formed utterances or by being able to →identify appropriate and well-

formed utterances. This requires several sub-competences, in particular →perception, →conceptualization, and action (→attribution, →purpose) competences, as well as being able to apply regular →mappings to →constructions underlying utterances in the context of interpretation, and to apply regular →mappings to conceptualizations that shall be verbalized in the context of production.

mapping, inversed alternative to regular mapping (→mapping, regular). In i. m., the →construction is not →diagrammatically iconic with respect to the order in which the →conceptualization (and the →circumstance) unfolds but to the order in which a →concept is examined, or scanned. Corresponds to a PSC-landmark (→trajector & landmark) mapping in German.

mapping, regular conventionalized pattern of how parts of →constructions (phrases) in a language are related to parts of →conceptualizations across types of constructions. For instance, in a regular mapping exhibiting →diagrammatic iconicity (order in which conceptualization unfolds), the →trajector is coded as PSC, the object landmark by means of an NP with oblique (dative or accusative) case, the location landmark within a PP, the circumstance including manner specification as verb, path specification as P. Can be →exploited.

meaning the m. of an utterance is not identifiable, since it is not identified here with →conceptualization. It can only be specified negatively: The m. of an utterance is what did not let fail the verbal interaction, or alternatively, the m. of an utterance is what sustains the illusion of →understanding each other. Trying to clarify the m. of some successful verbal interaction verbally leads to an infinite semiosis: The m. of the m. negotiating utterances would have to be discussed again by m. negotiating utterances and so on *ad infinitum*.

motion change of position over time and/or change of →feature over time of (an) inanimate →object(s). →Circumstances constituted by m. are processes. To be differentiated from →movement/activity. M. can be recognized on the basis of bottom-up sensation (→perception).

motivation here mainly a property of the arrangement of signs. If signs can be shown to be arranged in accordance with →diagrammatic iconicity or in accordance with other cognitive requirements (e.g., economy or efficiency considerations), then this arrangement is motivated. Processes (→circumstance) leading away from m. due to diagrammatic iconicity are accompanied by →exploitation.

movement change of position over time and/or change of →feature over time of (an) animate object(s). →Circumstances constituted by m. are activities. To be differentiated from →motion/process. Requires top-down identification.

neuronal re-enaction Analogous to →conceptualization which simulates the →perception of something in the absence of stimuli, neuronal re-enaction consists in neuronal activity in the absence of the perceptual experience or the motor activity with which it is originally associated, respectively.

object (perception, conceptualization) result of the integration of disintegrated →features in sensation thanks to the working of the →gestalt laws. What can be an o. of →perception or →conceptualization is thus conditioned by there being o. →features, i.e., by being figure-apt (→figure & ground). Figure-aptness is of crucial importance for certain linking phenomena.

perception the processes/activities (→circumstance) leading from light waves hitting the retina over the building up of a percept (bottom-up) to the →identification of the percept (top-down) as an instance of some category. The percept as the result of sensation is a structural description of the stimuli in the visual field due to retinotopic mappings. Being able to describe the percept means to have recognized it. The percept can be shown be →underspecified with respect to action-theoretic, →causal, physical, and socio-cognitive considerations (→attribution).

pertinence the significance of a perceived (→perception) or conceptualized (→conceptualization) →feature or →object for the action planning (→purpose) of an →actor/cognizer. P. are those features or objects that are part of the circumstances that instantiate a subordinate or superior purpose of the actor/cognizer. The p. of a feature or object co-determines not only whether something is identified/conceptualized but also the taxonomical level at which it is identified/conceptualized.

praxis interdependences of acts (→action) that are regular, rule-governed, and that are actualized independently of particular persons. Praxes can be sub-classified with respect to practical domains. Sociocultural praxis concerns the interdependences of acts that constitute and let succeed our living together in everyday life. Of special importance in sociocultural praxis are the factors underlying →attribution.

purpose results or outcomes of acts (→action) that shall be brought about (as goals) or avoided/maintained (as interests) in order to fulfill the needs of →actors/cognizers. Actors/cognizers know which action →schemas

are appropriate means to put their p.s into effect. P.s can be sub-classified into subordinate and superior p.s. Realizing p.s requires the actualization of action schemas. Since p.s involve bringing about →circumstances, →objects and →features in these circumstances are →pertinent. →Attributing →responsibility involves attributing a p. to the person in question.

recognition → perception

reference relationship between signs and →concepts, the latter being connected to →objects in the environment via joint attentional (simulated) →perception. Fixing r. in verbal interaction in acquisition works (in the case of →motivation) by the triangulation between speaker, hearer, and →object, or (in the case of →exploitation) with the help of joint →pertinences, common ground, and the evaluation of practical consequences of the utterance in question.

research programme a codified complex of assumptions supplementing a model that makes the empirical cycle work. The model contains the data, observations, descriptions, explanations, and tests that constitute the empirical cycle. In accordance to research →purposes certain heuristics, criteria, and absolute assumptions are supposed to circumvent the inherent problems of the empirical cycle.

responsibility binary distinction, →attributed or not attributed to animate →objects in activities (→circumstance). Whether someone is attributed r. or not depends on the precariousness of activities and on the factors underlying →attribution performance. In childhood, some activities are invariantly associated with credit or blame, others are precarious in that it depends on certain socio-cognitive criteria, whether the animate object deserves credit or blame and is attributed r. The crucial implication of the attribution of responsibility is the ascription of reason to the animate →object and that he/she/it could have desisted from the activity.

responsible causer preference (RCP) psycho- and neurolinguistic generalization saying that →actors/cognizers treat the first "incoming" ambiguous NP referent as the (responsible (→responsibility) causer (→causation) of the →circumstance in →incremental interpretation. This overwhelming cognitive tendency is enforced by certain formal and non-formal properties of the NPs and their referents. The RCP is an expression of the large-scale law of →closure.

salience the →features of →objects in the visual field which are rendered more

prominent in relation to a perceiver (→perception) than other features and which therefore are more likely to be attended to by the perceiver. Prominent are those features that grab the perceiver's attention, measurable in terms of eye fixation/foveal seeing. Salient stimuli may interfere with present →purposes and thus with the →identification of →pertinent stimuli. They force the perceiver to identify these stimuli.

schema as a theoretical term the result of abstracting (Lat. *abstrahere* 'draw off') differences between →features, →objects, or →circumstances encountered in various occurrences. In other words: treating as invariant what actually differs in featural, positional, temporal, or other aspects. Schematization expresses itself in activities: Something gets schematized if an animate object actualizes similar movement schemas towards (slightly) differing features, objects, or circumstances.

sensation → perception

trajector & landmark the notions giving structure to →conceptualization and →concepts, analogously to →figure & ground. Since conceptualization is simulated →perception, the conceptual counterpart of a perceptual figure is a t. The conceptual counterpart of a perceptual ground is a l. Due to its independence of the presence of stimuli, conceptualization and with it t/l segregation are more flexible than figure/ground segregation in that a vantage point can freely be chosen by the conceptualizer. T. & l. are regularly mapped (→mapping, regular) to NPs. Especially the landmark has some importance for the temporal organization of →circumstances and the temporal semantics of utterances.

underspecification property of →percepts, →concepts, and the semantics of utterances in relation to their specificity as required in successful verbal interaction. →Perception and →conceptualization are u. in the sense that percepts and concepts concern only sensible matters. Dispositions, accomplishments and misaccomplishments, attitudes etc., and often causes (→causation) and physical properties of →objects which are all important for the syntax-semantics relationship are not sensible and thus absent from percepts and concepts. These matters must be imposed on percepts and concepts by means of →attribution. Utterances are u. firstly because they (and the words they are made of) code mainly differentiations from conceptualization which in turn are u. with respect to actional matters (→attribution), and secondly because of the privacy of conceptualization, causing that two conceptualizations by two persons underlying a single utterance are never identical.

understanding u. an act (→action) requires the ability to specify to which →purpose

the →movement (chain) in question was considered a means to put into effect. U. action in general requires the ability to tell apart those movements which are acts and those which are instances of →behavior on the basis of the →attribution →praxis enacted within the respective lifeworld. In verbal interaction, complete u. is an idealization, since the entire overlap of →conceptualizations of two conceptualizers on the basis of a single utterance is virtually impossible (→underspecification). Successful verbal interaction thus relies on "the illusion of u." which gets destroyed if the verbal interaction fails.

utterance-as-instruction basic assumption according to which an utterance serves as an instruction for simulating a perceptual experience (→conceptualization). What makes the instruction possible is a →motivated relationship between →constructions and conceptualizations (and eventually →attributions) in terms of →diagrammatic iconicity.

Appendix A: The status of traditional semantic notions in the present theory

agent

Traditionally, agents are (prototypical) volitional causers. Lacking volition, they are "only" causers or effectors. Lacking causation, they remain (non-prototypical) agents. Here, volition can be reconstructed by means of attributing responsibility. Attribution of responsibility involves the attribution of reason or intentional activity to the person in question. This is associated with the ascription of a purpose to this person. The activity of the person is then considered to be a means to put this purpose into effect. The advantage of the present characterization lies in the fact that volition need not objectively be postulated or stipulated by the linguist or by the actor/cognizer but follows from the attributional praxis enacted in a community and allows for cross-culturally variable notions of "agentivity", as far as the attribution part of the notion is concerned. That means agentivity is given where responsibility is attributed. This is an all-or-nothing matter. The attributional part of agentivity is independent of causation which is independently characterized. Causation, in opposition to responsibility, may exhibit prototype effects and has a cross-culturally constant characterization because it is grounded in perception. That means traditional "agentivity" is a notion that cannot be uniquely characterized.

argument structure

(also: predicate-argument structure). Argument structure is a descriptive device that originates in a philosophical research programme whose research purposes are completely different from the purpose of describing in a psychologically plausible manner the human competence of relating linguistic^{o} signs and concepts (+/- attributions). It thus lacks research programmatic legitimation as a descriptive means at least in the present framework. It is replaced here by a dynamic conceptualization activity in which a circumstance (i.e., the traditional predicate) is identified as an aspect of the perceivable/conceptualizable object(s) that constitute the circumstance. A circumstance cannot be conceptualized without conceptualizing (an) object(s) first. A verb, by sourcing out an aspect of an object concept in verbalizing a conceptualiztion, pretends that the circumstance was something different from the object. In this sense is language misleading and in a sense hypostatizes the unity of object and circumstance. A predicate is the back projection from language (verb) to truth-oriented semantics (predicate), from where it has found its way into modern, cognitively oriented linguistics, where it was and is mistakenly considered

psychically real.

beneficiary The thematic role of beneficiary (not identical with recipient) is reconstructed here as the referent of the (dative) NP who has an interest in the circumstance described by the rest of the utterance, or who has it as a goal. This explains why a beneficiary does not stand in a relation to the other complement referents in the circumstance but to the circumstance as a whole, and why he/she is always animate.

CAUSE CAUSE is often used as a so-called base predicate in the decomposition of circumstances. By far the most of these proposals rely on a rather intuitive concept of causality, i.e., of what can cause what, and regarding the perceptual and conceptual conditions on there being a causal relationship. In the present proposal, what we call causes and effects is derived from the features and properties of perception and identification/categorization, for instance affordances, features, motion/movement, the contingency model, haptic perception and neural re-enaction.

experiencer So-called psychic verbs have not separately been dealt with here, because they are considered to work like – and to have developed from – verbs which code circumstances originating in visual, haptic or other experiences. Experiencers are traditionally those animate beings in circumstances that are in some psychic state that is described by the verb. They often range high on the thematic hierarchy, close behind agents and causers. From the perspective taken here, this is due to their features which make these referents potential responsible causers. That means "experiencers" are potentially satisfying the RCP and are thus ranked high thematically. In this respect they are related to beneficiaries who are also always animate and potential RCPs. It is not by accident then that experiencers are often marked with dative case in German and other Indo-European languages.

goal The traditional goal role is assigned to NPs to which movement/motion is directed. It is often differentiated from recipients by means of the animacy feature. Here, goals are also characterized as the NP referent towards which some movement/motion proceeds. However, it is unspecified with respect to figure-aptness, i.e., it may be an object or location but is always a landmark. This is its defining feature which partially differentiates it from recipients.

instrument The instrument can be characterized here partially similarly to how it is characterized in Cognitive-Functional Linguistics, namely by recourse to a causal chain. The instrument is an inanimate object which

undergoes force by another object (ideally animate due to the RCP), and exerts force on another object (landmark). However, the present framework provides the perceptual psychological and neuro-scientific background that the CFL accounts lack.

location Most thematic role theories except the Cognitive-Functional linguistic theories lack a perceptual psychological account of what locations actually are. They rather presuppose an intuitive understanding of the notion and thus of the corresponding thematic role. Here, the location role can be reconstructed as the location landmark in a simple spatial circumstance.

meaning A survey of what is traditionally meant by "meaning" cannot be accomplished here. In the present framework, the meaning of an utterance is what did not let fail the verbal interaction. It is thus negatively characterized, and alternatively as that what maintains the "illusion of understanding". Due to the perspective-dependence and underspecification of perception – and thus conceptualization –, due to the underspecification of utterances, and due to the eventual inexplicitness of utterances regarding attributional matters, the identity of the conceptualizations (+/- attributions) of both speaker and hearer with respect to some utterance is precluded. What sustains the praxis-coordinating functioning of language notwithstanding these shortcomings is called "meaning" here.

patient Patients are mostly those referents that undergo some change of state by the circumstance described by the verb, or that are causally affected by that circumstance. Such a characterization can to some degree be accepted here as a reconstruction of the patient role, but it can be grounded in perception and conceptualization more accurately. Object landmarks that undergo exertion of force by some trajector, thereby either changing some feature, location, or their integrity (and thus identity), can be called patients.

qualia structure Traditionally, qualia structure is supposed to capture the relational force of a lexical item in terms of what it is made of, its formal characteristics, its function, and its involvement in agentive circumstances. It can be viewed here as a placeholder for all theoretical proposals attempting to describe actor/cognizers' encyclopedic knowledge about objects and circumstances. However, most of these proposals simply stipulate these "quales", i.e., the constitution of this knowledge. In the present work, I have attempted to reconstruct what actors/cognizers know about the things and circumstances in their environments by means of a theory of perception, causation,

conceptualization, and action (attribution). Of crucial importance are the notions of salience, pertinence, frequency and especially that of affordance. My account of affordances is based on psychological and neuroscientific evidence and their significance need not be stipulated. The telic quale can be reconstructed on the basis of action competence and attribution. In combination, the above notions accomplish what qualia accomplish and even more, since frequency and pertinence are factors that are not taken into account in other proposals.

recipient The traditional recipient is often treated as an animate goal. The recipient can here be reconstructed by the notions of asymmetric bi-directionality, a feature licensing dative case, and by its restriction to object landmarks. Thus, where there is no (or where this is not clear) asymmetric bi-directionality and/or an object landmark in conceptualization, there will not be a recipient.

semantics In the present work, "semantics" is the cover term for those conceptualizations (+/- attributions) that can be shown to be coded by means of the verb-complement structures that can be extracted from utterances. As a linguistic discipline dealing with conceptualization and attribution, a thus characterized semantics grounded in perception and action (attribution) is non-objectivistic and must refer to perceptual psychology, neurosciences, philosophy, social psychology, and sociology, at least. In order to account for the linking competence, the semantics of utterances must also rely on conceptual and attributional matters that reduce the inherent underspecification of linguistic^{o} signs. A "lexical" semantics dealing only with "core meanings" cannot accomplish this.

source The object or location landmark from where some movement/motion proceeds. If it is an animate object landmark, traditional thematic role theories have to deal with the problem that this object could also be characterized as a causer/effector or an agent – yielding different predictions as to its syntactic behavior. In the present framework, where utterances code conceptualizations and conceptualizations are simulated perceptions and may be supplemented by attributions, this problem does not arise, since source, causer, and agent may simply describe different, but synchronous aspects of that object. What is determinative of its syntactic behavior, however, is its embeddedness in a whole circumstance concept.

thematic role Traditionally, thematic roles are generalizations over the features of the argument(s) of a semantic predicate in order to capture regularities in the mapping between semantic and syntactic structures serving to

characterize the relationship between syntax and semantics as non-accidental. The set of roles proposed mostly contain roles (or feature sets) that comprise spatially (e.g., theme, goal), temporally (e.g., extent), causally (e.g., causer), and actionally (e.g., agent) grounded aspects. Beyond noticing these different domains these domains are mostly not separately explored and explicated. In the present framework, all roles from all domains can be accurately reconstructed: spatial and temporal roles from the detailed spatio-temporal conceptual structure developed, causal roles from the proposal on causation developed, and actional roles on the basis of the action/attribution theory developed. The generalizations that traditional thematic roles allow can be reconstructed by taking into account the notion of regular (and inversed) conceptualization-construction mapping by means of diagrammatic iconicity.

theme

The theme is traditionally that object in a circumstance that moves. It is therefore often difficult to distinguish from the agent and patient roles. In the present framework, themes can also be reconstructed by means of moving objects. Though, this feature alone is not informative. In order to be able to make some statement as to its linguistic^{o} realization one must know how it is embedded in a circumstance, whether it is trajector or landmark, whether it undergoes some change, whether it is animate, whether it can be attributed responsibility or not, and so on. Only a sub-set of these parameters qualifies an object as a theme, others as an agent or a patient etc. Again, theme, patient, and agent may simply describe different, but synchronous aspects of the object in question. What is determinative of its syntactic behavior, however, is its embeddedness in a whole circumstance.

transitivity

Transitivity is mostly characterized with reference to the interplay between the semantics of the subject, the (grammatical) object, and the verb. High transitivity is mostly associated with an agentive, volitional, highly individuated subject, a causative verb, and a (grammatical) object being affected by the force exerted by the subject referent. Theories differ as to the precise features of the (grammatical) object. However, the present theory may reconstruct the notion of transitivity anyway: the semantics of the subject by means of mapping a responsible causer to the PSC, and by means of mapping a however conceptualized landmark on the second, oblique case-marked complement. The latter may undergo change of feature, position, integrity, and may undergo exertion of force, thus modulating the distinctiveness between the two objects and thus the degree of transitivity. From the perspective of the RCP, optimal transitivity would be that including a responsible causer exerting force on a

landmark that does not compete for the responsible causer role. It would thus not exhibit features licensing a dative, would certainly be inanimate but presumably individuated (i.e., figure-apt), and would lose its integrity through the force exerted by the responsible causer. Thus conceived, this circumstance would perfectly satisfy the actor/cognizer's need for large-scale closure in that the front end and back end of the circumstance are definitively fixed, leaving nothing imponderable and uncalculable about the circumstance.

truth

Bearing in mind the embodied character of our cognitive activities and their results, as well as the fact that claims of validity for assessments must rely on the intersubjective traceability of how these assessments have come about, an objective notion of truth is not available, according to which those assessments are true which correspond to reality. Such a theory is not available, since reality is not available. The traditional notion of truth as correspondence must therefore be replaced by a notion of truth that must be produced: Truth for which one may claim validity is success in joint action.

universality

Universality with respect to the linking competence applies to cognitive psychological, neuroscientific, socio-cognitive, sociological, actional (attributional), and/or syntactic/grammatical statements that are claimed to be valid for all human beings supposed to possess the linking competence. Of all the sub-competences that have been discussed in this work, which of these competences or mechanisms can be asserted to be universally applicable? I would argue that universals apply only on very schematic levels: The bottom-up mechanisms of sensation seem to be applicable to all speakers of all languages. The overall conceptual operations seem to be applicable to all speakers of all languages. There being some attributional praxis seems to be applicable to the speakers of all languages. Regular conceptualization-syntactic construction mappings seem to be applicable to all languages. On the other hand, languages and the speakers of these languages may differ with respect to how they have routinized their identification/categorization (is something identified as 'plant', 'tree', or 'Cinnamomum loureiroi'), conceptualization, and attribution performances (which are the determining and determined factors underlying attribution), and how they have conventionalized the mappings between certain conceptual contents and constructions/parts of speech (how do they map manner and motion in circumstances to parts of speech? Which of the possible conceptual and actional differentiations are conventionalized to license passivization? To which degree are constructions homonymous due to the conflation of many conceptual differentiations in few constructions?)

Appendix B: SyHD materials

1 List of the dialect regions within the borders of Hesse:

dialect regions	transition zones
Northern Hessian A	Northern Hessian/Central Hessian
Northern Hessian B	[Northern Hessian/Thuringian]
Central Hessian A	Northern Hessian/Eastern Hessian
Central Hessian B	Central Hessian/Moselle-Franconian A
Eastern Hessian	Central Hessian/Moselle-Franconian B
Rhine-Franconian A	Central Hessian/Moselle-Franconian/Rhine-Franconian
Rhine-Franconian B	Central Hessian/Eastern Hessian/Eastern Franconian
[Westfalian]	Central Hessian/Rhine-Franconian
[Eastfalian]	

Table AB.1: Dialect regions within Hessian borders
(on the basis of Wiesinger 1983)
(Regions in angled brackets partially exhibit dative/accusative syncretisms and have been partialled out from the results.)

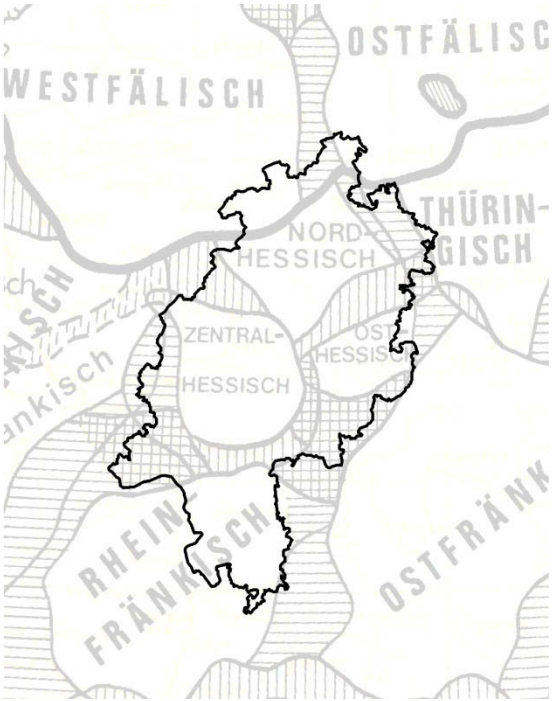

Figure AB.1: Map of Hesse, crossfaded with dialect classification
(on the basis of Wiesinger 1983)

2 Dialectal SyHD tasks (selection of dialectal variants for each scenario)

Scenario D:

7. Sie haben sich von einer Freundin für eine Familienfeier mehrere Gläser geliehen. Durch Willi, Ihren von der Grippe geschwächten Vater, ist bei der Feier eines davon zu Bruch gegangen. Als Sie die Gläser Ihrer Freundin zurückgeben wollen, sagen Sie zu ihr:

→ *Bitte kreuzen Sie die Sätze an, die Sie in Ihrem Platt/Dialekt sagen können* (auch Mehrfachnennungen sind möglich).

a) ☐ De Willi hot eens von deine Gleser rengergeschmisse.

b) ☐ Dem Willi es eens von deine Gleser rengergefalle.

→ *Würden Sie den Satz normalerweise in einer Form sagen, die gar nicht aufgeführt ist? Wenn „ja“: Bitte notieren Sie hier den Satz so, wie Sie ihn normalerweise sagen würden:*

c).....

→ *Welcher Satz ist für Sie der natürlichste?*

a) ☐ , b) ☐ oder c) ☐

Northern Hessian A

a) ☐ De Willi hot aans von deine Gläser erunnergeschmisse.

b) ☐ Dem Willi es aans von deine Gläser erunnergefalle.

Central Hessian A

a) ☐ Däer Willi hot eins von dinne Gläser rengergeworfe.

b) ☐ Dem Willi es eins von dinne Gläser rengergefalle.

Eastern Hessian

a) ☐ Der Willi hot ans vo deine Gläser runnergeworfe.

b) ☐ Dem Willi es ans vo deine Gläser runnergefalle.

Central Hessian/Moselle-Franconian A

Scenario B:

25. Während Ihre Tochter und Ihr Schwiegersohn im Urlaub sind, kümmern Sie sich um deren Pflanzen. Beim Durchgehen durch die Wohnung stoßen Sie gegen den größten Pokal Ihres Schwiegersohnes. Er fällt herunter und ist kaputt. Als die Urlauber wiederkommen, sagen Sie zu Ihrem Schwiegersohn:

→ *Bitte kreuzen Sie die Sätze an, die Sie in Ihrem Platt/Dialekt sagen können* (auch Mehrfachnennungen sind möglich).

a) ☐ Ich ho dein Pokal ronnergewoarfe.

b) ☐ Mer is dein Pokal ronnergefalle.

→ *Würden Sie den Satz normalerweise in einer Form sagen, die gar nicht aufgeführt ist? Wenn „ja": Bitte notieren Sie hier den Satz so, wie Sie ihn normalerweise sagen würden:*

c).....

→ *Welcher Satz ist für Sie der natürlichste?*

a) ☐ , b) ☐ oder c) ☐

Central Hessian/Eastern Hessian/Eastern Franconian

a) ☐ Ech hon dinnen Pokal rongergeschmissen.

b) ☐ Me is dinn Pokal rongergefallen.

Northern Hessian B

a) ☐ Eich hu dein Pokal ronnergeworfe.

b) ☐ Mir es dein Pokal ronnergefann.

Central Hessian B

a) ☐ Ich hon dinn Pokal rengergeworfe.

b) ☐ Mer es dinn Pokal rengergefalle.

North Hessian/East Hessian

Scenario F:

13. Sie hatten zwei Wochen lang die Handwerker im Haus, die Ihnen das Bad neu kacheln sollten. Als die Handwerker endlich weg sind und es wieder leise im Haus ist, bemerken Sie, dass aus Ihrem Waschbecken eine Ecke herausgebrochen ist. Sie berichten daraufhin Ihrem Mann:

→ *Bitte kreuzen Sie die Sätze an, die Sie in Ihrem Platt/Dialekt sagen können* (auch Mehrfachnennungen sind möglich).

a) ☐ Die Hondwerker hawwe des Waschbegge kabudd gemoacht.

b) ☐ De Hondwerker is des Waschbegge kabudd gange.

→ *Würden Sie den Satz normalerweise in einer Form sagen, die gar nicht aufgeführt ist? Wenn „ja“: Bitte notieren Sie hier den Satz so, wie Sie ihn normalerweise sagen würden:*

c).....

→ *Welcher Satz ist für Sie der natürlichste?*

a) ☐ , b) ☐ oder c) ☐

Rhine-Franconian A

a) ☐ Die Hondwärjer häwwe des Waschbegge kabudd gemoacht.

b) ☐ De Hondwärjer is des Waschbegge kabudd gange.

Rhine-Franconian B

a) ☐ De Handwerker ho de Spülsteeh kabütt gemocht.

b) ☐ Denn Handwerkern es de Spülsteeh kabütt gegange.

Central Hessian/Northern Hessian

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